



THE



BULLETIN

College of
Arts and
Sciences

AMERICAN UNIVERSITY

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Catalog Issue

THIS CATALOG has been prepared primarily for the student interested in either full-time or part-time study in the College of Arts and Sciences. Other available publications regarding Schools and Colleges of The American University are:

School of Business Administration. *Degrees offered:* Associate in Business Administration; Bachelor of Science in Business Administration; Master of Business Administration. (Doctorate offered through the Graduate School.)

School of Government and Public Administration. *Degrees offered:* Associate in Arts; Associate in Public Administration; Bachelor of Arts in Government; Bachelor of Science in Public Administration; Master of Arts (government, public administration). (Doctorates offered through the Graduate School.)

School of International Service. *Degrees offered:* Bachelor of Arts; Master of Arts; Master of International Service. (Doctorate offered through the Graduate School.)

Graduate School. *Degrees offered:* Doctor of Philosophy in area studies, business administration, economics, government, history, international relations and organization, mathematics, psychology, public administration, sociology and statistics; Doctor of Education.

The Washington College of Law. *Degree offered:* Bachelor of Laws.

Division of General and Special Studies. Non-degree division of the University.

General Information Bulletin. Published annually, this Bulletin provides important supplemental information on a University-wide basis and should be used in conjunction with each School Catalog.

Wesley Theological Seminary. The Seminary is affiliated with the University and located on its campus. *Degrees offered:* Bachelor of Sacred Theology; Master of Sacred Theology; Master of Religious Education.

For complete information and appropriate catalog concerning each college or school of the University, phone, write or visit:

Office of Admissions
The American University
Massachusetts and Nebraska Avenues, N. W.
Washington 16, D. C.
Telephone: 244-6803

THE
American University
BULLETIN

College of Arts and Sciences



Catalog 1963-1965

Volume 39 Number 11 September 1963

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WASHINGTON, D. C.

ACADEMIC CALENDAR

1963-1964

Fall classes begin	September 16
Thanksgiving recess	November 28-December 1
Christmas vacation	December 22-January 5
Fall session ends	January 25
Spring classes begin	February 3
Washington's Birthday holiday	February 22
Spring vacation	March 22-29
Memorial Day holiday	May 30
University fiftieth annual Commencement	June 7

1964-1965

Fall classes begin	September 21
Thanksgiving recess	November 26-29
Christmas vacation	December 20-January 3
Fall session ends	January 30
Spring classes begin	February 8
Washington's Birthday holiday	February 22
Spring vacation	April 11-18
Memorial Day holiday	May 30
University fifty-first annual Commencement	June 13

Summer Sessions

Class dates are announced in the Summer Session Bulletin published each March.

Students are requested to see each Session Bulletin published prior to the session for a more detailed schedule. Any changes or adjustments necessary in the academic calendar above will be noted in the Session Bulletin.

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*The right is reserved to modify this catalog at any
time and upon such modification all persons shall be
bound thereby, including enrolled students.*

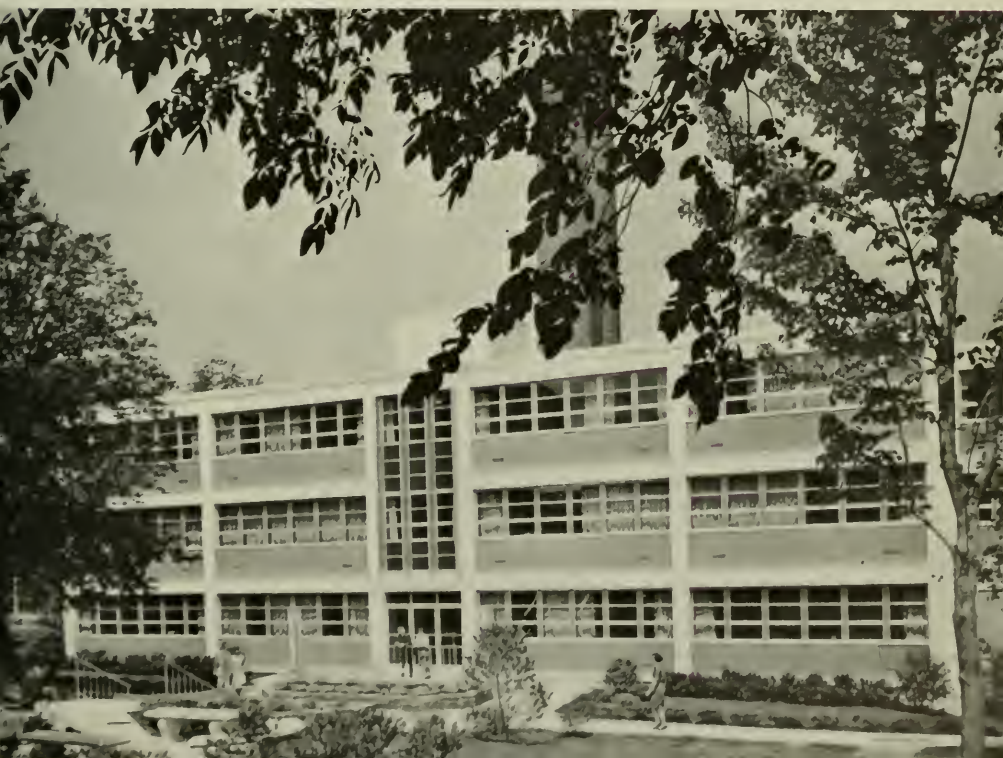
ADMINISTRATIVE OFFICERS OF THE UNIVERSITY

Hurst R. Anderson, L.H.D., LL.D., Litt.D.	President of the University
Donald Derby, Ph.D.	Vice President: Dean of Faculties
William O. Nicholls, M.B.A.	Vice President: Treasurer and Business Manager
Stafford H. Cassell, M.S., LL.D.	Vice President: Administra- tive Assistant to the Presi- dent
K. Brent Woodruff, M.A.	Vice President: Director of University Development
LeRoy Graham, B.D.	Chaplain of the University
Charles Van Way, Jr., M.B.A.	Dean of Students
Susan Olson, M.A.	Associate Dean of Students, Dean of Women
Joseph Neale, S.T.B.	Dean of Men; Foreign Stu- dent Adviser
David A. Tucker, Ph.D.	Director of Testing and Guid- ance
Herbert P. Stutts, M.S.	Director of Placement and Housing
John Wakefield, B.S.	Director of Admissions
Lois E. Torrence, Ph.D.	Director, Office of Institu- tional Studies
Martha Short, B.S.	Registrar
Irving Spalding, Jr., B.A.	Alumni Secretary
Anne Jensen, B.S. in L.S.	Librarian
Helen L. Chatfield	Archivist of the University
Ruth E. Johnson	Bursar
Merrill Ewing, M.B.A.	Controller

DEANS OF SCHOOLS AND COLLEGES

Ralph C. John, Ph.D.	Dean, College of Arts and Sciences
Nathan A. Baily, Ph.D.	Dean, School of Business Administration
Ernest S. Griffith, D.Phil., Litt.D., L.H.D.	Dean, School of International Service
Earl H. De Long, Ph.D.	Dean, School of Government and Public Administration
Sumner O. Burhoe, Ph.D.	Dean (Acting), Graduate School
John S. Meyers, LL.B.	Dean, Washington College of Law
Richard M. Bray, M.A.	Associate Dean of Faculties; Dean, Division of General and Special Studies

Asbury Administration Building



THE COLLEGE OF ARTS AND SCIENCES

Office of the Dean

Ralph C. John, Ph.D.	Dean of the College
Lawrence W. Wadsworth, Jr., Ph.D.	Associate Dean for Under-graduate Programs
Ruth McFeeter, M.A.	Associate Dean for Academic Counseling
Genevieve E. Poole, M.A.	Academic Counselor
Dorothy C. Love, A.A.	Assistant to the Dean

Division Chairmen

Harold A. Durfee, Ph.D.	Humanities
Matthew F. Norton, Ph.D.	Natural Sciences and Mathematics
Ellis Weitzman, Ph.D.	Social Sciences
Jack H. Yocum, Ph.D.	Fine and Communicative Arts
John W. Devor, Ph.D.	Education

Faculty Committees

CURRICULUM

Dorothy D. Gondos, Ph.D.	(1966)
Bernard Miller, Ph.D.	(1965)
David J. King, Ph.D.	(1964)

FACULTY AND TEACHING

Donald M. Williams, Ph.D.	(1966)
Mary H. Aldridge, Ph.D.	(1965)
Harvey C. Moore, Ph.D.	(1964)

HONORS BOARD

Bancroft W. Sitterly, Ph.D. (1966)	John C. Scott, Jr., Ph.D. (1965)
Theodore R. Rosché, Ph.D. (1966)	Andrew S. Keck, M.A., M.F.A. (1964)
Charles M. Clark, Ph.D. (1965)	Bernard Miller, Ph.D. (1964)

TEACHER EDUCATION

Edward I. Burkart, M.S. (1966)	Thomas W. Evaul, P.E.D. (1964)
Martha C. Sager, Ph.D. (1965)	James L. McLain, B.A. (1964)
Austin Van der Slice, Ph.D. (1965)	John W. Devor, Ph.D. (<i>Ex Officio</i>)

Standing Committee

Administrative committee of Deans and Division Chairmen which advises on actions and programs in the College.

GENERAL INFORMATION

The University publishes an annual **General Information Bulletin**. This bulletin contains information about the University's history, organization, faculty, facilities, programs and degrees, admission requirements, academic information, finances, financial assistance, student personnel services, residence facilities, student activities, alumni activities, and special university programs. Please consult this bulletin for information about any of these areas.

Accreditation

The American University is accredited by the Middle States Association of Colleges and Secondary Schools and the University Senate of The Methodist Church.

It is a member of the Association of American Colleges, the Association of Urban Universities, the Association of University Evening Colleges, the National Intercollegiate Athletic Association; and approved by the American Association of University Women.

The University is a charter member of the Council of Graduate Schools in the United States and is a member of the Midwest Conference on Graduate Study and Research.

The School of Business Administration is a member of the Middle Atlantic Association of Colleges of Business Administration.

The Washington College of Law is a member of the Association of American Law Schools and is approved by the American Bar Association.

The Department of Education in the College of Arts and Sciences is a member of the American Association of Colleges for Teacher Education.

The Wesley Theological Seminary is accredited by the American Association of Theological Schools and the University Senate of The Methodist Church.



COLLEGE OF ARTS AND SCIENCES

The College of Arts and Sciences of The American University was established in 1925. Originally called the College of Liberal Arts, this academic unit has developed as the largest and most complex part of the University. Most of the liberal arts fields are represented through its faculty and programs.

The founders of The American University intended that the new institution in the Nation's Capital should develop primarily as a center of graduate studies. The first curricula were limited to this level. Experience proved, however, that undergraduate studies in many ways significantly support graduate work. Now the College, in addition to its undergraduate offerings, provides programs of study leading to the master's degree and in a number of fields (through the Graduate School) to the doctorate.

OBJECTIVES

The College is primarily concerned with liberal studies which convey an understanding of the universe and man. Its academic programs are intended to develop perceptive judgments and an ability to enjoy the pursuit of knowledge throughout life.

On both the undergraduate and graduate levels, the faculty constantly strives to offer educational programs of the highest quality for their academic and professional purposes. Opportunities are afforded through honors programs and programs of independent study for superior students to fulfill their intellectual potentialities.

The College is a part of the only Protestant university in the Nation's Capital. It attempts to confront students of all faiths with ultimate moral and religious issues in a community of free inquiry. It hopes thereby to free them from possible provincialisms regarding the world, its people, and their problems.

A program of balanced general studies is required of all undergraduates. Subsequently they take advanced work under the direction of a major department in order to perfect skills and acquire the ability to utilize general concepts for the attainment of personal and social goals.

Most departments of the College offer graduate degree programs in which a capacity for original thinking, skill in research, and correlation with other fields of knowledge are objectives of major consideration.

Specific ways through which these objectives are achieved are indicated by the departmental requirements listed under the various degree programs as outlined in this publication.

ADMISSION

Applications for admission to any academic program of the University should be sent to the Office of Admissions, The American University, Washington 16, D.C. Information on admission requirements will be found in the *General Information Bulletin*.

In addition to the general standards and procedures pertaining to all undergraduate applicants, the College of Arts and Sciences offers the following special admissions opportunities.

Early Admission

The College welcomes early admission requests from students of superior ability whose academic achievement and general maturity are such that, after three years of high school, they can handle successfully college level work. Many colleges and universities have accepted with excellent results carefully screened applicants who qualify in this way. This process is sometimes called "admission without diploma," but usually Early Admission.

The Director of Admissions is glad to receive inquiries from high school principals or counselors, or directly from prospective students about Early Admission criteria and procedures. Each case is considered on its own merits. The following factors, however, are important in the evaluation:

1. the high school record with special reference to grades and the pattern of courses taken;
2. performance on the College Entrance Examination Board;
3. the recommendation of the high school principal and counselors; and
4. an interview with the applicant by the Director of Admissions and the Dean of the College.

Sometimes additional tests of ability, social maturity, or interests may be required.

Waiver and Placement

Waiver and placement examinations, open to students in all schools and colleges of the University, are provided during Orientation Week in Backgrounds of Civilization (freshman history), languages (French, German, Spanish, and Russian), and mathematics. Students eligible to attempt these examinations are notified prior to initial registration in their school or college.

Waiver of Composition and Reading (freshman English) is based on performance on the English Achievement Examination and Writing Sample of the College Entrance Examination Board. This examination and sample are required for freshman admission.

Advanced Standing

Many high schools are offering college level courses in some of the basic academic fields. Also some secondary school teachers, through special work, lead students to above average achievement in the subjects which they instruct. To require these students to take beginning college courses in these fields results in needless repetition.

The advanced standing program makes it possible for students to receive credit for beginning college courses and frees them to undertake studies at a higher level.

Advanced standing can be achieved on the basis of the Advanced Placement Examinations of the College Entrance Examination Board. These examinations must be taken in the high schools, many of which offer this service. The test results are sent to the University, after being scored by Educational Testing Service, where they are evaluated on the basis of norms established by the Admissions Office and the College.

Though advanced standing is not restricted to those who have had honors courses in high school, this is the best way to qualify for this special consideration. The fields in which advanced standing may be achieved in the College through the examinations of the College Entrance Examination Board are:

American History	French
Biology	German
Chemistry	Literature
English Composition	Mathematics
European History	Physics
Spanish	

These examinations must be taken in the high schools before coming to college. Inquiries should be addressed to College Board Advanced Placement Examinations, Box 592, Princeton, New Jersey.

General Information

Admission to the University is required for consideration for any of these programs for superior students. For further admissions information write to the Director of Admissions, The American University, Washington 16, D.C. 20016, 244- or call (Area Code 202) 244-6803.

Graduate Admission

For information on graduate admission see the *General Information Bulletin* or the Graduate School Catalog. Minimum admission requirements are stated in these source publications.

In the College, graduate applications are carefully evaluated by the department and division chairmen. In most departments a formal standard substantially beyond the minimum stated for the University as a whole is required. Furthermore, favorable admissions action may depend upon the ability of a department to assume responsibility for additional graduate students at that time.

Initial graduate admissions inquiries should be made to the Office of Admissions, The American University, Washington 16, D.C.

Late Admission

The College accepts in degree status only those students who have been fully admitted at the beginning of the registration period for the session in which the study is initiated. In some cases those not fully admitted may be permitted to enter part-time in non-degree status through the Division of General and Special Studies.

A maximum of 30 credit hours for undergraduate degrees and 12 credit hours for graduate degrees may be transferred from non-degree status at the time of admission.

Readmission

A student whose study in the University is interrupted for any reason for a period of one calendar year or more must apply for readmission. If readmission is approved, he returns subject to the academic requirements and regulations in effect at the time of readmission.

CURRICULA AND DEGREES

The College of Arts and Sciences offers curricula leading to the following degrees: the Associate in Arts, the Bachelor of Arts, the Bachelor of Science, the Master of Science in Science Teaching, the Master of Education, the Master of Science, the Master of Arts, and (through the Graduate School) the Doctor of Philosophy and the Doctor of Education.

The requirements of the various degree programs are fully stated in this *Catalog*. *Each student is held responsible for his own status and progress relative to his particular objective.* The role of the academic adviser is to assist the student in his academic planning, not to control his course registrations in relation to various formal requirements. The Adviser, the Dean, and the Registrar are always glad to answer questions and provide counseling.

UNDERGRADUATE PROGRAMS

Bachelor's Degree Requirements

Undergraduate students work closely with advisers in developing courses of study. Each must complete the following requirements for the Bachelor's degree:

- University Requirements
- College Requirements
- Major Requirements
- Related and Tool Requirements
- Electives (to complete 126 credit hours)

These requirements are described below to assist the student in planning his progress toward his degree objective.

University Requirements

University requirements are designed to perfect the basic skills needed by every student, to provide a background of knowledge which makes it possible for him to move easily in the universe of ideas, and to help him appreciate the values found in the modern world. These courses also provide a general program for his first two years, especially if during these years he is indefinite on his major field of concentration. When a student begins a major in his first year, the University requirements courses may be spread over three or even four years.

University requirements are binding on *all* undergraduate degree candidates and constitute approximately one-third of their studies. These requirements consist of *Basic Studies*, 12-16 credit hours, and *General Studies*, 26-27 credit hours, a total varying from 38 to 43 hours. A normal first semester program for an entering freshman consists of Basic Studies (7 credits); General Studies (6 credits); and a course in the major or some other area of special interest (3 credits).

Courses taken within the major school or department may not count toward meeting University requirements in the social sciences, sciences, and humanities.

Freshmen have University requirements explained in detail in the progress of pre-registration and orientation. Those transferring into the University from other colleges and universities are mailed a University requirements check-list with transfer credits indicated. Any questions concerning University requirements should be directed to the Associate Dean for Undergraduate Programs.



Counseling with Dean of College

The courses of the University requirements program for both Basic Studies and General Studies are listed below. Attention is called to the alternatives available in each of the three areas of General Studies courses.

I. Basic Studies (12-16)

- A. 23.100—Composition and Reading I
23.101—Composition and Reading II
- B. 29.100—Backgrounds of Civilization I
29.101—Backgrounds of Civilization II
- C. Health and Physical Education
 - 49.101—Personal Health (1 credit hour)
 - 49.102—Orientation to Physical Education (1 credit hour)
 - 49.103—Physical Education Activities (2 credit hours)

II. General Studies (26-27)

- A. Natural Sciences—One two-session laboratory course (8 credits) *or* three non-laboratory courses (9 credits). One mathematics course may be used in the non-laboratory sequence.

Laboratory Courses (a full year in one)

- 9.110- 9.111—General Zoology and General Botany
- 15.110-15.111—General Chemistry I & II
- 27.101-27.102—Principles of Earth Sciences I & II

- 51.210-51.211—Elements of General Physics I & II
51.220-51.221—Fundamentals of General Physics I & II

or

Non-Laboratory

- 9.100—Human Biology
15.100—Science of Chemistry
27.100—Earth Sciences (May substitute 27.150—Basic Geography (4)
51.100—Science of Physics
Mathematics (one course may be substituted for a non-laboratory science)
41.100—Survey of Mathematics I
41.110—Fundamentals of Mathematics I
41.160—Basic Mathematics

B. Social Sciences (9)

Three courses (9 credits) chosen from:

- 19.200—Introduction to Economics
33.200—Introduction to World Politics
53.200—American Government: National (until September 1, 1964) *or*
53.100 Modern Government
57.200—General Psychology
65.200—Introduction to Sociology
65.201—Introduction to Anthropology
33.110—{ Human Behavior (12 credit hours fulfill 3 credit hours of the
33.211—{ social science requirement for SIS students)

C. Humanities (9)

Six credits in one of the following areas and three in another:

American Civilization

- 33.100-103—American Civilization (12 credit hours fulfill 6 credit hours of the Humanities requirement for SIS students)

Art

- 5.104—Introduction to the Visual Arts
7.100—Survey of Art I
7.101—Survey of Art II

Literature (Language-literature courses may be used)

- 23.120—World Literature I
23.121—World Literature II

Language—Second Year (Permissible as University requirement for Schools of Business, Government and Public Administration and School of International Service only.)

Music

- 43.100—Appreciation of Music I
43.101—Appreciation of Music II

Philosophy

- 47.100—Logic and the Scientific Method
47.101—Introduction to Philosophy

Religion

- 47.150—Introduction to the Old Testament
47.170—Introduction to the New Testament

Speech and Drama

- 67.122—Introduction to the Theatre

College Requirements

Language. Undergraduate students (including both freshmen and transfers) who are admitted to degree programs in the College must complete two years of study in French, German, Spanish, or Russian. This requirement may be waived entirely or partly on the basis of high school achievement or a satisfactory score on a placement examination in one of these languages.

Students admitted prior to the Fall Session, 1961, must complete the departmental language requirements in force at the time of their admission.

Foreign students for whom English is a second language must comply with the above requirement.

Inquiries on waivers, Advanced Placement, and Advanced Standing in all fields should be made to the Associate Dean for Academic Counseling.

Graduate Record Examinations. All graduating seniors in the College are required to take the Advanced Test of the Graduate Record Examinations in their major field. The Area Tests of the Graduate Record Examinations are administered to students in fields for which no Advanced Test is available. These tests are administered in the spring session, usually in mid-March. Students should refer to the session course announcements for the specific schedule of a given year.

Those who do not perform satisfactorily on these examinations (below one standard deviation under the national mean) will be permitted to graduate only on the basis of the special recommendations of their department chairmen. Other examinations, or course work beyond the minimum stated for graduation, may be required.

Those who do not take the Graduate Record Examinations when scheduled at the University must make arrangements and take the tests at their own expense at an Educational Testing Service Center. Information is available at the College of Arts and Sciences Office.

Students completing graduation requirements during the summer, or at the end of the fall session, should take these examinations when offered at the University during the previous spring session.

Individually arranged attempts of the Graduate Record Examinations scheduled through Educational Testing Service Centers are not accepted in fulfillment of this requirement unless prior approval is received from the department chairman and the Dean.

Major Requirements

University and College requirements, as described, provide a broad intellectual base through distributed studies. By the end of the sophomore year, and frequently earlier, the student must choose a field of concentration, an academic major in one of the departments of the College. It is in this field that he undertakes study in depth.

An academic major requires a minimum of 24 credit hours of course work in a field of concentration. In some departments 36 or more credit hours may be required. Specific requirements are indicated in the section of this *Bulletin* which lists departmental offerings.

Those interested in the sciences, mathematics, and music need to take specific courses in the freshman year which are prerequisite to other courses to be taken later. These students should declare their interest as early as possible with the Associate Dean for Academic Counseling and the appropriate academic department so that the proper sequence of studies can be arranged.

The requirements of a major, as well as University and College requirements, must be completed before clearance can be given for graduation.

Major Fields of Study. Major fields of study for the Bachelor of Arts or Bachelor of Science degrees are indicated along with the departmental course offerings. A single department may provide more than one specialization as, for example, in the case of the Department of Languages and Linguistics where a degree may be earned in French, German, Russian, or Spanish.

Application for Major. All students must apply to the department in which they wish to specialize for admission to junior-senior standing. Admission to the University does not automatically constitute admission to the major, which requires specific approval of the department chairman. This may be done (on forms provided through the departments and in the Dean's office) at the end of the freshman year and must be done by the end of the sophomore year.

Students on academic probation normally are not admitted to a major. Also the academic departments may establish standards beyond the minimum stated for the University as a whole for admission to major status.

Transfer of Major. Students who wish to transfer their majors from one department to another, or from one school to another, must go through the procedure described in the paragraph above. The transfer is not official until specific approval has been received from the appropriate department chairman and is recorded in the Registrar's Office.

Related and Tool Courses

Each department requires its students to take a minimum of 12 credit hours on an advanced level in fields related to the major. This is to encourage breadth and interdisciplinary interest. Some departments require minors, or secondary concentrations.

Some departments also have a tool requirement, such as mathematics or statistics.

Related and tool requirements of the departments are stated, along with major requirements, in the departmental sections of this publication.

Electives

In addition to University requirements, College requirements, major requirements, and related and tool requirements, the student may take elective courses to complete the minimum 126 credit hours necessary for graduation. Elective courses in which a student may follow his interests into a number of fields are considered an important part of the academic program in the College.

ASSOCIATE IN ARTS DEGREE

Many high school graduates do not or for some reason cannot remain in college for four years and yet desire to complete a two-year program. This fact, along with the development of the junior college, has contributed to the popularity of the Associate in Arts degree which may be awarded at end of sophomore year.

To receive an Associate in Arts degree the student must (1) complete University requirements (38-43 credit hours), (2) complete through the intermediate level studies in a modern foreign language, and including the above (3) have a minimum 63 credit hours of course work with a C average or better.

The College offers the Associate in Arts degree in general studies only.

Those interested in an Associate in Arts degree must make application in the Registrar's Office by the deadline published for all degrees in each Fall session course announcement.

PRE-PROFESSIONAL PROGRAMS

Pre-professional curricula are offered in dentistry, medicine, law, physical therapy, medical technology, social work, and theology. A student interested in one of these fields should consult the Associate Dean for Academic Counseling before his initial registration. An adviser representing the special field of interest will be assigned.

In physical therapy, where upper-level courses are not offered at the University, it is expected that the student will transfer to a school having the required curriculum at the end of the sophomore year.

In medical technology the work of the senior year is completed in a local medical laboratory or hospital and a degree is awarded.

Many pre-theological students are attracted to The American University. The presence of the Wesley Theological Seminary on the campus, along with the offerings of the Department of Philosophy and Religion and the religious activities under the direction of the University Chaplain, provide excellent conditions for pre-professional studies in religion.

PRE-MEDICAL and PRE-DENTAL

The Association of American Medical Colleges (AAMC) publishes annually an *Admissions Requirement Handbook* on pre-medical programs and the requirements for admission to AAMC approved medical schools. The pre-medical student is urged to own a copy of this publication, which may be ordered through the Association of American Medical Colleges, Department 1B, 2530 Ridge Avenue, Evanston, Illinois. The price is two dollars (\$2.00) postpaid.

Medical schools normally require a minimum of three years of undergraduate studies and strongly recommend completion of the Bachelor's degree. There is no inclination to prescribe the undergraduate major in view of an interest in students with varied intellectual concerns and backgrounds.

While there is some variation of practice, medical schools in general require the following undergraduate studies: two years of chemistry, one year of biology, one year of physics, and one year of English. In some instances one year of mathematics and two years of a modern foreign language also are required. It is emphasized that these are minimum requirements and, again, the student is urged to consult the *Admissions Requirement Handbook* (available in the offices of the Departments of Biology and Chemistry) and his adviser.

This basic pattern applies to pre-dental students as well as to others interested in veterinary medicine, medical technology, and other related fields.

It is usual for medical and dental schools to require a medical aptitude examination administered in the prospective student's junior year in college. The applicant is responsible to arrange personally for this examination and inquiries should be addressed to Medical College Admission Test, The Psychological Corporation, 304 East 45th Street, New York 17, N. Y.

Those who as undergraduates choose to major in one of the science departments should, in the freshman year, consult an adviser in that department.

NURSING EDUCATION

Admissions to the Bachelor of Arts degree in Nursing Education were discontinued as of the beginning of the Fall session, 1962. Students admitted to this program prior to that date are given five years, or until September, 1967, to complete their studies. Inquiries should be made to the Chairman of the Department of Education.

COMBINED LAW DEGREE

In this program a student who has completed a minimum of 96 credit hours (including University and College requirements) toward his degree in the College of Arts and Sciences, and who meets the admission requirements of the Washington College of Law, is permitted to complete his undergraduate degree requirements with the first year of full-time study in law school. He also must have a minimum of 18 credit hours of upper-level course work in one department of the College, meet the two-year foreign language requirement, and take the appropriate Graduate Record Examination.

Under this combined degree program, students pay the usual undergraduate tuition during their first year of law school and receive a Bachelor of Arts degree in Pre-Legal Studies at the end of that year, if they have met all requirements and have maintained a satisfactory average in their law studies. Any interested student should consult the Dean early in his undergraduate program in order to make sure that his preparation and courses of study will satisfy the requirements for both the undergraduate and the law degrees.

Favorable recommendation to the Washington College of Law is contingent upon a strong academic record in the first three years of undergraduate studies and other qualities which indicate probability of success in this degree pattern and profession.

Beginning law students are admitted for the Fall and Spring sessions only; initial studies may not be undertaken in a Summer session.

GRADUATE PROGRAMS

Master's Degrees

The degree of Master of Arts may be earned in the College in the fields of Anthropology, Art, Economics, Education, English, French, German, History, Journalism, Linguistics, Mathematics, Music, Philosophy, Psychology, Public Relations, Religion, Russian, Spanish, Speech Arts, Sociology, and Statistics.

The Master of Science degree is offered in Biology, Chemistry, Earth Sciences, and Physics. There also are programs leading to the Master of Education and the Master of Science in Science Teaching degrees.

For information on Master's degrees especially designed for teachers the student is referred to the Chairman of the Division of Natural Sciences and Mathematics in connection with the Master of Science in Science Teaching and to the Chairman of the Department of Education for the Master of Education.

To qualify for the Master's degree the candidate must (1) complete with an average grade of B or better a minimum of 30 hours of graduate credit, of which 24 hours must be taken at The American University (and up to six hours of which may be taken in thesis research or through other research accepted in lieu of a thesis), (2) pass one or more comprehensive examinations as required



President Kennedy Receives Honorary Degree

by the department and (3) present a thesis or its equivalent acceptable to an examining committee in the department of specialization.

Through a reciprocal arrangement some courses may be taken in other Washington area universities as residence credit. These courses may be undertaken only after full graduate admission status is granted at The American University and under the specific direction of the student's major adviser.

Candidates for Master's degrees may be required by their departments to pass proficiency examinations in a language or quantitative tool, or both.

The catalog of the Graduate School fully describes the minimum requirements for Master's degree programs. Interested persons are referred to this source for additional information, though it must be understood that the requirements of the College frequently are above the minimum requirements of the University. The following factors are summarized:

1. Admission is based upon a degree from a regionally accredited college or university, with the appropriate specialization, and an undergraduate record which gives promise for successful graduate study. No more than six credit hours of undergraduate deficiency may be allowed in connection with a favorable admissions action.

2. Admission to graduate study does not mean that the student is advanced to candidacy for the degree which he seeks. Advancement can take place only after 12 credit hours of course work in residence have been completed with a satisfactory record (minimum B average) and must be accomplished upon the completion of 18 credit hours.

All undergraduate deficiencies must be completed before advancement to candidacy is granted.

3. Comprehensive examinations are required for the Master's degree. The student must have completed a minimum of 24 credit hours of course work (or be registered for courses which will take him to this minimum) to establish eligibility for comprehensive examinations.

4. A satisfactory thesis, or non-thesis option, must be completed under the direction of the major department.

Schedule deadlines for application for approval of thesis proposals, scheduling of tool examinations, admission to comprehensive examinations, and submission of thesis manuscripts must be observed as publicized in the various session bulletins.

Students registered in Master's programs are administratively responsible to their departments and the Dean of the College of Arts and Sciences, while those in doctoral programs are responsible to their departments and the Dean of the Graduate School.

Statutory Limitations on Graduate Admission and Candidacy

Students admitted to Master's degree programs in the College are required to qualify for and be advanced to candidacy within two years of admission and to complete the remaining requirements for the degree within three years after advancement to candidacy.

Students must register for course work within one year of admission to graduate study.

The admission status of students who do not progress toward their degree objectives within these limits is automatically invalidated.

Doctor's Degrees

Doctor's degree programs are offered under the direction of the Graduate School (see Graduate School Catalog) for students of the College of Arts and Sciences, the School of Business Administration, the School of Government and Public Administration, and the School of International Service.

The Doctor of Philosophy degree may be earned through the departments of the College in the fields of Economics, History, Mathematics, Psychology, Sociology, and Statistics.

The Doctor of Education degree may be earned through the Department of Education.

Information on admission to doctoral studies, degree requirements, advancement to candidacy, comprehensive examinations, and dissertations may be found in the Graduate School Catalog.

PROFESSIONAL CERTIFICATES IN EDUCATION

The Department of Education offers Professional Certificates in Elementary Education, Secondary Education, School Administration and Supervision, and the Work of the School Psychologist. The Psychologist Certificate requires the concurrence of the Department of Psychology.

Students who desire these certificates are required to follow a program of courses appropriate to the particular certificate in question. A minimum of 30 credit hours beyond the Master's degree must be completed with grades of B or better.

Professional certificates may be earned by students who register in non-degree status. Under these circumstances, however, no more than twelve credit hours (and this depending upon the relevance and the quality of the work) may be applied toward any degree for which the student subsequently is admitted.

ACADEMIC INFORMATION

General academic information and regulations are presented in the University's *General Information Bulletin* which outlines policy on academic loads, registration procedures, the grading system, University honors, and other subjects of interest to students and faculty. Unless otherwise indicated it can be assumed that the College operates under these regulations. Within minimum University requirements, however, a school or college may establish other policies binding for its own academic program.

The following regulations are applicable to all students in the College of Arts and Sciences.

Absences

The obligation of undergraduate students to attend class sessions is assumed. Absences must be justified to instructors with the understanding that it is the student's responsibility, if excused, to make arrangements for make-up work.

Veterans and other students studying at government expense are subject to the loss of educational benefits for excessive absences.

Class attendance for graduate students is voluntary.

Academic Dismissal

Undergraduate students are required to maintain a 1.00 cumulative index, or a C average.

An evaluation is made of each student's academic record at the end of each year of full-time study (freshman, sophomore, junior), or its equivalent in the case of part-time students. Those who do not meet the minimum grade requirements are dismissed.

Students who enter their senior year in good standing but who drop below a 1.00 cumulative index anytime thereafter are dismissed.

Graduate students seeking Master's degrees are required to maintain a minimum 2.00 cumulative index, or a B average. Those who complete 12 credit hours of course work without the required index, or who drop below at any time thereafter, are dismissed.

All grades earned in any status are computed into the cumulative index. When courses are repeated the grades achieved in both attempts stand separately on the transcript and are used in the mathematical determination of the average. Only one attempt of a given course, however, may be counted toward fulfillment of graduation requirements.

Graduate students who twice fail comprehensive examinations are automatically dismissed. This action also is mandatory when the chairman of the thesis committee, or the department chairman, certifies failure to complete a satisfactory thesis project.

Academic Probation

A freshman who fails to achieve a 1.00 index, or C average, during his first two semesters (24-30 credit hours), but whose cumulative index is .750 or above, may be placed on academic probation for his second year at the discretion of the Dean.

Student Responsibility

The University Faculty has formally adopted the following statement on student responsibility:

The American University expects that each student, as a mature member of the academic community, will adhere to the highest standards of personal integrity and good taste in his conduct and in his relationships with others.

The maintenance of such standards is a condition of continued enrollment as a student of the University, and any individual whose attitude or behavior suggests that he is not constructively committed to them may be dismissed from the University even though his record may be otherwise satisfactory.

Performance in the Major

The minimum acceptable grade for courses used in fulfillment of the requirements of the undergraduate major is C. Course credit in the major field for which the grade of D is received may be used as elective credit. If in computing all of these grades together, however, the student has less than a 1.00 average in the courses of his major field he is subject immediately to dismissal, regardless of cumulative index.

Foreign Language Course Regulation

It is necessary to complete successfully the second session of a beginning or intermediate foreign language course to receive academic credit for the first session of the same course. This includes beginning and intermediate intensive language courses.

Graduate Credit for Seniors

A student in the last semester of his senior year may provisionally identify a course or courses for graduate credit if these studies represent credit in excess of that needed to complete the requirements of the undergraduate degree. This must be done at the time of registration, and requires the recommendation of the department chairman, the concurrence of the Dean, and a record of the agreement in the student's academic file.

The final acceptance of this credit toward the requirements of a graduate degree is dependent upon subsequent admission to graduate standing and the acceptability of the credit to the department directing the student's graduate program.

In no case will credit earned before the last semester of the senior year be applied as graduate credit.

Residence Requirements

The last 30 credit hours of course work for any degree must be done in residence, except in the case of the Master's degree, for which six of the total credit hours required may be transferred from another regionally accredited institution with the approval of the major department.

An undergraduate student who transfers from another institution with advanced standing in the field of the major is required to do a minimum of 12

credit hours of upper-level course work in the department of the College from which he is recommended for graduation. More may be required by the department chairman.

Transfer Credit

Students who take courses in other colleges and universities for transfer credit to The American University must receive prior approval from their advisers and the Dean. This work usually is undertaken during the summer in an institution near the student's home or as a part of an overseas study program (junior year abroad).

Graduate Credit Earned Off-Campus

The University offers numerous courses off-campus in the Washington area and at military bases in the South. Normally no more than twelve credit hours of course work earned at these locations may be applied toward the requirements of a graduate degree. The two exceptions recognized by the faculty of the College are Dahlgren Naval Weapons Laboratory and the David Taylor Model Basin, where respectively there are master's programs in mathematics and physics.

Correspondence Credit

The American University does not conduct any correspondence programs.

Up to 15 credit hours of course work earned through correspondence study with other regionally accredited colleges or universities may be accepted in the College, provided the credit was earned prior to admission to The American University.

This limit is not applicable for the United States Armed Forces Institute (USAFI).

Regulations Subject to Change

The University reserves the right to change the regulations stated in this or other published materials, or to cancel or change the course offerings and schedules given in this announcement at any time without notice.

HONORS STUDY

A special honors program has been established within the curriculum of the College and exists on two levels: General Honors and Departmental Honors. General Honors study is oriented to the freshman and sophomore years, while Departmental Honors study is oriented to the junior and senior years.

General Honors

Students who are selected for General Honors take a series of four colloquia across four consecutive semesters under the direction of an honors professor. The topics discussed draw upon the natural sciences, the social sciences, and the humanities. Special attention is given to value and relational considerations and, generally, to theoretical topics.

The honors colloquia are carried by students as elective courses for three semester hours of academic credit in each of the four semesters of their General



President Anderson Makes Award at Honors Convocation

Honors study. It is expected that University requirements (such as freshman English, history, and science) will be met by these students in the conventional way.

Students are invited to participate in this program after a careful analysis of previous achievement, or they may apply for admission to General Honors study through the Office of the Dean of the College of Arts and Sciences. Upon the successful completion of the colloquia "General Honors" is indicated on the commencement program.

Departmental Honors

Departmental Honors study, limited to juniors and seniors, is under the direction of the chairman of the department in which the student is a major.

Up to 12 credit hours may be awarded for departmental honors projects. This usually is at the rate of three credit hours each semester across the four semesters of the junior and senior years.

This study is handled on a tutorial basis, with the honors candidate doing independent study in an area of special interest. Any major with a superior academic record may apply to his department for this special privilege. Those who complete this sequence graduate with "Departmental Honors," a distinction which is indicated on the commencement program.

CENTER FOR LIBERAL STUDIES

The Center for Liberal Studies was established as a non-departmental component of the organization of the College with the beginning of the Fall session, 1962. It is related directly to the Office of the Dean and functions under the supervision of a Board of Directors.

The objectives of the Center, for practical reasons limited to the areas of the humanities and the fine arts at this time, are as follows: To bring into residence outstanding artists and scholars to enrich the intellectual atmosphere of the campus through creative work, lectures, and informal conversations; to provide leadership in establishing regular lectureships and in organizing symposia on topics of intellectual interest for presentation to students, faculty, and the greater Washington community; to provide an entity with which research in the humanities might be associated in the future; and to bring together a group of interested individuals to give careful attention to the place of the liberal arts in a university environment.

The program of the Center became effective with the beginning of the Fall session, 1963, when a lecture series was announced and the first Associate-in-Residence was appointed.

SPECIAL LECTURES

Convocations and lectures are an integral part of the intellectual experience of the University community. Two important lectureships have been established in the College: The Faith and Freedom Lectures and the Bishop John Fletcher Hurst Philosophy Lectures.

The Faith and Freedom Lectures

The Faith and Freedom Lectures, as the name suggests, bring distinguished scholars to the campus to discuss some aspect of man's spiritual heritage relative to its implication for the concept of freedom. The lecturers in this series have been as follows:

<i>Year</i>	<i>Lecturer</i>
1959	Dr. Nels F. S. Ferre Professor of Theology Andover-Newton Theological Seminary
1960	Dr. Paul Tillich University Professor Harvard University
1961	Dr. Hans Morgenthau Professor of Political Science University of Chicago
1962	Dr. John Wild Professor of Philosophy Northwestern University
1963	John Courtney Murray, S.J. Professor of Theology Woodstock College

The Bishop John Fletcher Hurst Philosophy Lectures

These lectures were established in honor of the founder of the University. Each year some philosophical theme is developed by a prominent scholar in this field. The lecturers in this series have been as follows:

<i>Year</i>	<i>Lecturer</i>	<i>Subject</i>
1958	Dr. Walter Kaufmann Professor of Philosophy Princeton University	"The Significance of Martin Buber"
1959	Dr. Richard Brandt Professor of Philosophy Swarthmore College	"Ethical Relativism"
1960	Dr. Maurice Mandelbaum Professor of Philosophy The Johns-Hopkins University	"Historicism, a Key to the Nineteenth Century"
1961	Dr. George Shrader Professor of Philosophy Yale University	"Ethics and Existence"
1962	Dr. Justus Buchler Professor of Philosophy Columbia University	"Reflections on the Problem of Meaning"
1963	Dr. Brand Blanshard Professor of Philosophy Yale University	"The Sane and the Eccentric in Present Day Thought"

The Humanities Symposium

For the past several years the Division of the Humanities has sponsored an annual Humanities Symposium. This symposium, which brings a panel of scholars to the campus to discuss an announced topic, is conducted in the Spring by one of the departments in the area of the humanities and the fine arts. It has become an important event on the calendar of the University.

COURSES OF INSTRUCTION

The following pages describe by divisions the offerings of the departments of the College of Arts and Sciences. Session bulletins are published three times annually (Fall, Spring, and Summer), and should be used for registration purposes. The University reserves the right to cancel or change any course listings in this bulletin or other published announcement at any time.

Course Numbering System

The arabic numeral in parentheses following the course titles indicates the semester credit hours earned for successful completion of the course.

Each course is identified by a decimal number. The number to the left of the decimal (1-75) identifies the department in which the course is offered. The series of three numbers to the right of the decimal indicates the level of the course. Courses numbered .001-.099 carry no credit. Courses numbered .100-.499 are for undergraduate students. Courses numbered .500-.599 are for graduate and advanced undergraduate students. Courses numbered .600-.799 are for graduate students only.



Battelle-Tompkins Library

Reading and Research Courses

In addition to the courses listed below, undergraduate and graduate students may register for specialized reading and research courses for which they are qualified and which are appropriate to their programs.

Regular courses in the curricula of the departments may not be offered through the device of these independent studies. These courses are intended to provide the student with an opportunity to pursue special interests into areas not covered in other ways.

Undergraduate Reading and Research Courses. An undergraduate student who wishes to enroll in these courses must be recommended by his major department, must have pursued the background courses essential to the successful pursuit of the proposed project, and must have completed 63 semester hours of college work, at least six of them in this University, with a cumulative academic index of 1.75 or better. Properly qualified undergraduate students may earn a maximum of 12 credit hours by independent study but may not register for more than two independent study courses during any session. Registrations will be accepted only during regular registration periods. Each course must be completed within a single session.

Graduate Reading and Research Courses. A graduate student recommended by his department is eligible to register for a reading course after the completion of at least six hours of approved graduate work in residence with an average of B or better. A student may register for an independent research project (not for thesis purposes) after the completion of at least 12 hours of approved graduate work in residence with an average grade of B or better.

No graduate student may apply more than six hours of work in a reading course, independent research course, in-service project or institute, or more than nine hours in any combination of these courses, toward meeting the course hour requirements for the Master's degree. Graduate reading courses must be completed within a single academic session (except that two five-week summer sessions may be allowed) and research projects must be completed within one calendar year after registration.

Registration for Reading and Research Courses. Students permitted to enroll in the independent study courses listed below should enter on their registration cards the indicator number (3-69) of the department which will supervise their work, followed by the number of the particular course to which they are being admitted, as indicated below.

Undergraduate Courses

- .390-91 Individual Study Project (3 each)
- .490-91 Individual Research Project (3 each)
- .398-99 Departmental Honors (3 each)—Juniors
- .498-99 Departmental Honors (3 each)—Seniors

Graduate Courses

- .099 Graduate Study (no credit)
For graduate students who have completed course work and thesis seminar for an advanced degree and who wish to continue on the rolls of the University to complete their thesis, case studies, or other requirements.
- .590 Reading Project (3)
- .690 Research Project (3)



DIVISION OF HUMANITIES

**ENGLISH
LANGUAGES
LINGUISTICS
PHILOSOPHY
RELIGION**

ENGLISH

Professors: MERRITT C. BATCHELDER; CHARLES M. CLARK (Chairman); HAZEL H. FEAGANS (Emeritus); MARY L. B. TEETER (Emeritus); RUDOLPH VON ABELE; LOUISE M. YOUNG. *Associate Professor:* MARY M. PATTON. *Assistant Professors:* RAYMOND W. AIKEN; ARTHUR P. BEAN, JR.; WALTER A. BRANFORD; JAMES C. CLEES; MARY ANN G. HOOD; FAYE L. KELLY; FRANCES H. KING; GEORGE J. LOVE; JEANNE A. MASENGILL; SHIRLEY P. YARNALL; FRANCIS E. ZAPATKA. *Instructors:* DORIS N. CELARIER; DOROTHY A. OWENS; PETER L. SCOTT. *Adjunct Professors:* THOMAS J. FOYE; EDWIN E. GUNBERG; RALPH ROBIN. *Professorial Lecturers:* JOHN C. CLENDENIN; GERALD ELBERS; WILLIAM E. MOSIER. *Lecturers:* ROBERT B. ANDERSON; JAMES N. CARR; HAROLD D. EVANS; VIRGINIA HEFFERNAN; PHILIP W. IDE; MERTON M. JEFFERS; JOHN J. ROCHFORD; JEROLD ROSCHWALB; SUSAN P. WILLENS.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements38-43 hours

Language Requirement (French or German) 12 hours

Students entering the University with intermediate-level proficiency may substitute an advanced course.

Departmental Requirements:

Major Courses 30 hours

Six hours of the basic survey course in English literature and 24 hours of advanced courses in literature, writing, and English language as approved by the department. Students planning to teach should elect at least six credits in English language and linguistics.

Related courses 12 hours

Either 12 hours of advanced courses in one related field, as a minor; or six hours of advanced courses in each of two related fields. The following fields are recommended: art, history, journalism, linguistics, music, philosophy, speech arts, French or German literature.

Electivesto complete 126 hours

Secondary School Teacher Training

The Department of English, in cooperation with the Department of Education, offers a curriculum which will lead to certification for teaching English at the high school level. Students who have selected this as their vocational objective should see the teacher education adviser in the English Department during the second semester of the Freshman year.

Graduate Degree—Master of Arts

Course Requirements: Minimum of 30 hours of approved graduate work, including 23.797 Master's Thesis Seminar (6).

Written Comprehensive Examinations: Three, including one in the literary history of England, or in the literary history of the United States, or in the history of the English language; one in a selected period of English or American literature with special emphasis on a writer of the period; and one in a related field of literature, language, or other appropriate subject matter, as approved by the department.

Other Requirements: Proficiency examination in French or German. Thesis.

Graduate Comprehensive Examination Fields

Core Fields—Group A. 23.1 Literary History of England, 23.2 Literary History of the United States, 23.3 History of the English Language.

Core Fields—Group B (with special emphasis on a writer of the period chosen). 23.4 Sixteenth Century English Literature, 23.5 Seventeenth Century English Literature, 23.6 Eighteenth Century English Literature, 23.7 Nineteenth Century English Literature, 23.8 Twentieth Century English Literature, 23.9 American Literature before 1800, 23.10 American Literature 1800-1900, 23.11 American Literature 1900-Present.

Specialized Fields. 23.12 Comparative Literature (selected phases of two or more national literatures, one of them in English), 23.13 The Novel (country specified), 23.14 The Drama (country specified), 23.15 Poetry (form specified), 23.16 Humanism, 23.17 Neo-classicism, 23.18 Romanticism, 23.19 Realism and Naturalism, 23.20 Symbolism and Expressionism, 23.21 Literary Criticism.

UNDERGRADUATE COURSES

23.010 English Fundamentals (0) A review of basic principles of English usage: spelling, punctuation, grammar, sentence and paragraph construction. A non-credit course for selected entering students.

23.100 Composition and Reading I (3) Selected readings. Practice in writing. Emphasis on accurate and thoughtful reading, logical thinking, and clear, correct expression.

23.101 Composition and Reading II (3) Continuation of 23.100. Includes methods of research and preparation of a documented paper. *Prerequisite:* 23.100.

Special Sections:

**** 23.100-23.101 (FS).** A section of Composition and Reading designed for foreign students. Similar in content to the regular sections. Foreign students whose competence in English makes them eligible for college-level work are assigned to this section so that attention can be given to their special language problems.

**** 23.100-23.101 (SIS).** The section of Composition and Reading designed to meet the curricular needs of the students in the School of International Service. Readings in major literary works; writing and class discussions. Tutorial groups. Transfer students who have already met the University requirement in English may take this course for three hours credit.

- ** 23.101 (H) Honors Section.** Students are assigned to this section on the basis of excellence demonstrated in the first semester of the course. Readings on a selected theme; writing and class discussions.
- 23.103 Advanced Composition (3)** Expository writing. For students who have completed English Composition (6) and wish continued training and practice in the skills of writing.
- 23.120 World Literature I (3)** Introduction to literary forms and masterpieces of Western civilization from the ancient Greeks to the 18th century. Primarily for students not majoring in English.
- 23.121 World Literature II (3)** Introduction to literary forms and masterpieces of the 19th and 20th centuries in Europe and America. Primarily for students not majoring in English.
- 23.310 English Literature I (3)** Survey of English prose and poetry from the beginnings to the mid-18th century. *Prerequisite to advanced courses in English Literature.*
- 23.311 English Literature II (3)** Survey of English prose and poetry from the mid-18th century to the 20th century. *Prerequisite to advanced courses in English Literature.*
- 23.320 American Literature I (3)** A survey of American literature from the colonial period to about 1860. *Prerequisite to advanced courses in American Literature.*
- 23.321 American Literature II (3)** A survey of American literature from 1860 to the 20th century. *Prerequisite to advanced courses in American Literature.*
- 23.330 Introduction to the Short Story (3)** Development of the short story as an art form. Reading and analysis of stories by 19th and 20th century writers.
- 23.331 Introduction to Poetry (3)** Study of poetic forms and techniques, using a non-historical approach. Reading and analysis of English and American poems.
- 23.333 Introduction to Literary Criticism (3)** Readings in the mainstream of criticism and critical theory, from Plato to the present.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600 and 700-level courses are open only to graduate students.)

- 23.503 History of the English Language (3)** Development of the language from Old English to Modern English, with special studies on phonology, grammar, and vocabulary.
- 23.504 Modern American English (3)** The structure of American English, with emphasis on the application of modern linguistic science to the teaching of grammar and writing.
- 23.510 Creative Writing I (3)** Training in writing prose and poetry through individual literary projects suited to the student's needs and interests. *Prerequisite:* permission of instructor.

- 23.511 Creative Writing II (3)** Style and structure in writing prose and poetry. Practice in writing essays, short stories, and poems. Readings, discussions, conferences. *Prerequisite:* permission of instructor.
- 23.520 Chaucer I (3)** Introduction to the reading of Chaucer's poetry. Chaucer as man and poet, and his 14th century background. Readings in *The Canterbury Tales*.
- 23.521 Chaucer II (3)** Readings in *The Canterbury Tales*, *Troilus and Criseyde*, and some of the minor poems. *Prerequisite:* 23.520.
- 23.522 English Drama: 10th Century to 1642 (3)** The development of English drama through the study of the plays of the predecessors and contemporaries of Shakespeare and the post-Elizabethan playwrights.
- 23.523 Renaissance Literature (3)** Literature of the Renaissance in Italy, France, England, exclusive of drama, with emphasis upon the literature of the Tudor period in England.
- 23.524 Shakespeare I (3)** The earlier plays, with attention to the development of Shakespeare's artistry, his use of sources, the social and political backgrounds.
- 23.525 Shakespeare II (3)** The later plays.
- 23.526 Seventeenth Century Literature (3)** Commonwealth and Restoration Literature, with some attention to continental literature of the century, exclusive of drama.
- 23.527 Milton (3)** Readings in the major and minor poems, with special attention to *Paradise Lost*. Some readings in his prose works.
- 23.528 Studies in 18th Century Literature (3)** Literature of 18th century England, with special reference to outstanding authors and dominant literary forms in the neoclassical tradition.
- 23.531 The English Novel I (3)** The English novel in the 18th century. Reading of selected novels by Defoe, Richardson, Fielding, Smollett, Sterne, and Walpole.
- 23.532 The English Novel II (3)** The English novel during the 19th century. Selected novels by Scott, Austen, Dickens, Thackeray, Eliot, and Hardy.
- 23.533 Romantic Literature I (3)** A study of English literature of the Romantic Movement, with emphasis on Blake, Burns, Wordsworth and Coleridge.
- 23.534 Romantic Literature II (3)** A study of the chief writings of Byron, Shelley, and Keats, along with their 19th century contemporaries.
- 23.535 Victorian Prose (3)** The Victorian Age in English literature, as reflected in the work of selected major prose writers.
- 23.536 Victorian Poetry (3)** The major Victorian poets, Tennyson to Hopkins.
- 23.537 Modern British Literature (3)** British literature from 1900 to the present, exclusive of drama. Emphasis on major writers.
- 23.540 Emerson and His Era (3)** Study of the artistic achievement of the "American Renaissance" as embodied in the writings of Emerson, Thoreau, Hawthorne, and Melville.
- 23.541 Howells and His Era (3)** A study of post-bellum literary movements as reflected in the writings of Whitman, Howells, Twain, and Henry James.

- 23.542 The Romantic Tradition (3)** A comparative study of 19th century American literature and English literature of the Romantic Movement.
- 23.543 The Realist Tradition (3)** A comparative study of late 19th century American literature and English literature as related to the rise of Realism and Naturalism.
- 23.544 The American Novel I (3)** Development of the novel 1830-1900, as exemplified in the writings of major figures.
- 23.545 The American Novel II (3)** The development of the novel in the twentieth century through a reading of representative works by major figures.
- 23.546 Poetry in America (3)** Major figures in American poetry, with special attention to the period since 1914.
- 23.547 Modern American Literature (3)** Literature since 1900, with special attention to the period since 1920.
- 23.549 Modern British and American Drama (3)** Representative playwrights of Britain and America during the 20th century.
- 23.550 Classical Drama (3)** A study of Greek and Roman tragedy and comedy, through the reading of selected works in translation.
- 23.552 Comparative Literature I (3)** Comparative study of the writings of European authors in the Romantic tradition: Rousseau, Goethe, Stendhal, and others.
- 23.553 Comparative Literature II (3)** Comparative study of the writings of European authors of the late 19th and early 20th centuries: Nietzsche, Zola, Ibsen, and others.
- 23.554 Contemporary European Literature (3)** Comparative study of recent European writers: Kafka, Malraux, Camus, Koestler, and others.
- 23.555 Major European Novelists I (3)** Intensive study of major French and Russian novelists of the 19th century. (In translation).
- 23.556 Major European Novelists II (3)** Intensive study of major novelists of the 20th century. (In translation).
- 23.557 Modern European Drama (3)** Representative plays of European playwrights exclusive of the British Isles from the late 19th century to the present.
- 23.563 Children's Literature (3)** Sources and uses of stories and related materials in the elementary grades. Methods of teaching literature to children.
- 23.570 Interrelation of the Arts (3)** Study of the varieties and channels of relationship among the major arts (literature, painting, sculpture, architecture, and music).
- 23.572 Problems in Literary Criticism (3)** Intensive study of a specific problem in literary esthetics, the problem to vary from year to year. Enrollment limited. *Prerequisite:* 23.333 or equivalent.
- 23.620 Graduate Seminar in English Literature (3)** An intensive study of selected problems in English literature. (To be offered beginning Fall 1964).
- 23.630 Graduate Seminar in American Literature (3)** An intensive study of selected problems in American literature. (To be offered beginning Spring 1965).
- 23.797 Master's Thesis Seminar (6)** For M.A. candidates only. Methods and materials of research (3); the preparation of a thesis under the direction of a departmental committee (3).

LANGUAGES AND LINGUISTICS

Professors: JOHN G. FRANK; HUGO J. MUELLER (Chairman). *Associate Professors:* RUBERTA M. OLDS (Emeritus); MARGUERITE C. SUAREZ-MURIAS. *Assistant Professors:* EDWARD I. BURKART; MARIE A. CHARBONNEAUX; DIETER K. LOFFNER; GRACE S. MANCILL; VADIM MEDISH; HENRY M. NOEL; ELENI K. OKTAY; HUGO PINEDA; ROSEMARIE SAAL; GERTA M. H. URRY; KATHRYN D. WYATT; ZOE WYTHER. *Instructors:* MONIQUE DE JONG; RENEE W. FANTIN; REGINE J. GUNLICKS; OSCAR SALAZAR. *Professorial Lecturer:* EDWARD M. STACK. *Lecturers:* SACHIKO F. ASANO; EARL W. BROCKMAN, JR.; MARIANO GOWLAND; FRED Y. KALLINI; FRANCOISE LAULAN; NICOLE LONG; AMPHOL NUMATRA; PAUL R. VAULIN; J. WANG.

DEGREE PROGRAMS

Undergraduate Degrees—Bachelor of Arts in French, German, Russian, or Spanish

University Requirements38-43 hours

Departmental Requirements:

Major Courses24-46 hours

12-22 hours of elementary and intermediate language courses (intensive or non-intensive). Requirements of elementary and intermediate language course work can be waived if high school or other preparation warrants it. 24 hours of advanced courses for which the specific requirements are as follows:

FRENCH

- 37.300 Introduction to Language (3)
- 37.322-3 Survey of French Literature I and II (6)
- 37.420 French Civilization (3)
- 37.427-8 Advanced French I and II (6)
- and 6 hours in advanced French literature courses.

GERMAN

- 37.300 Introduction to Language (3)
- 37.332-3 Survey of German Literature I and II (6)
- 37.430 German Civilization (3)
- 37.437-8 Advanced German I and II (6)
- and 6 hours in advanced German literature courses.

RUSSIAN

- 37.300 Introduction to Language (3)
- 37.345-6 Survey of Russian Literature I and II (6)
- 37.447-8 Advanced Russian I and II (6)
- and 9 hours in advanced Russian literature courses.

SPANISH

- 37.300 Introduction to Language (3)
- 37.352-3 Survey of Spanish Literature I and II (6)
- 37.450 Hispanic Civilization (3)
- 37.457-8 Advanced Spanish I and II (6)
- and 6 hours in advanced Spanish or Latin-American literature courses.

Related Courses **12 hours**

A second foreign language, area studies, history, art history or English literature are recommended.

Electives **to complete 126 hours**

Graduate Degrees—Master of Arts in French, German, Russian, Spanish, or Linguistics

MASTER OF ARTS IN FRENCH, GERMAN, RUSSIAN, OR SPANISH

Course Requirements: Minimum of 30 hours of approved graduate work, including 37.797 Master's Thesis Seminar (6), or two 700-level research seminars (6 hours). Of the remaining 24 hours. 6-9 must be taken in theoretical or applied linguistics, 9-12 in the appropriate literature, and 6 in area and/or history courses related to the area. Students will choose the appropriate area and history courses offered in other departments.

Written Comprehensive Examinations: Two, including one in the appropriate literature and one in General or Applied Linguistics, or in the structure of the foreign language.

Oral Examination: An oral examination of approximately one hour's duration on the general field of the thesis (if one is submitted), on general or applied linguistics, and on the appropriate foreign literature. The examination is conducted, at least in part, in the foreign language.

Other Requirements: Thesis, or completion of two 700-level research seminars. Prerequisite for admission to a Master's program in French, German, Russian, or Spanish is proficiency in the foreign language, demonstrated either by a Bachelor's degree in that language, or equivalent preparation.

MASTER OF ARTS IN LINGUISTICS (with special emphasis on Teaching English as a Foreign Language)

Course Requirements: Minimum of 30 hours of approved graduate work, including 37.797 Master's Thesis Seminar (6), or 37.710 Seminar in Linguistics (3-6) and/or case study (3). Of the remaining 24 hours, twelve should be taken in theoretical linguistics, six in applied linguistics, and six in anthropology (65.534, 65.535, or 65.537) or American Civilization (33.604, 33.605).

Written Comprehensive Examinations: Two, including one in General Linguistics and one in Applied Linguistics.

Oral Examination: An oral examination of approximately one hour's duration on theoretical and applied linguistics, and in defense of the thesis (if one is submitted).

Other Requirements: Thesis, or completion of Seminar in Linguistics (37.710) for six hours, or 37.710 for three hours and a case study. Prerequisite for admission to the Master's program in linguistics is a working command of at least one modern foreign language.

Graduate Comprehensive Examination Fields

37.1 General Linguistics, 37.2 Applied Linguistics, 37.11 French Structure, 37.12 German Structure, 37.13 Russian Structure, 37.14 Spanish Structure, 37.21 French Literature, 37.22 German Literature, 37.23 Russian Literature, 37.24 Spanish Literature, 37.25 Latin American Literature. (37.21-25 with emphasis upon a particular author, movement, or literary form.)

UNDERGRADUATE COURSES

(Credit is given for the first semester of an elementary or intermediate language course only upon the successful completion of the second semester. In all language courses, students are expected to do individual language laboratory work outside of class.)

- 37.010 Language Conferences (No Credit)** Tutorial conferences to serve candidates for doctoral degrees preparing for tool examinations in modern languages. Offered to meet the needs of individual students.
- 37.120 Elementary French I (3)** Emphasis on audio-lingual skills. Drills on the main features of French structure. Inductive presentation of grammar. Basic vocabulary. Reading and writing as auxiliary skills.
- 37.121 Elementary French II (3)** Continuation of 37.120.
- 37.130 Elementary German I (3)** Emphasis on audio-lingual skills. Drills on the main features of German structure. Inductive presentation of grammar. Basic vocabulary. Reading and writing as auxiliary skills.
- 37.131 Elementary German II (3)** Continuation of 37.130.
- 37.140 Elementary Russian I (3)** Emphasis on audio-lingual skills. Drills on the main features of Russian structure. Inductive presentation of grammar. Basic vocabulary. Reading and writing as auxiliary skills.
- 37.141 Elementary Russian II (3)** Continuation of 37.140.
- 37.150 Elementary Spanish I (3)** Emphasis on audio-lingual skills. Drills on the main features of Spanish structure. Inductive presentation of grammar. Basic vocabulary. Reading and writing as auxiliary skills.
- 37.151 Elementary Spanish II (3)** Continuation of 37.150.
- 37.190 Elementary Ancient Greek I (3)** Presentation and drill of Greek structure. Basic vocabulary. Development of reading knowledge. Introduction to the position of Greek within the Indo-European family of languages.
- 37.191 Elementary Ancient Greek II (3)** Continuation of 37.190.
- 37.192 Elementary Latin I (3)** Presentation and drill of Latin structure. Basic vocabulary. Development of reading knowledge. Introduction to the position of Latin within the Indo-European family of languages.
- 37.193 Elementary Latin II (3)** Continuation of 37.192.
- 37.115 Intensive Elementary Thai I (6)** Emphasis on audio-lingual skills. Drills on the main features of Thai structure. Inductive presentation of grammar. Active vocabulary. Introduction to the writing system.
- 37.116 Intensive Elementary Thai II (6)** Continuation of 37.115.
- 37.125 Intensive Elementary French I (6)** Same course content as 37.120, supplemented by copious drills. Emphasis on pronunciation and fluency in common speech situations. Offered especially for French majors.
- 37.126 Intensive Elementary French II (6)** Continuation of 37.125.
- 37.135 Intensive Elementary German I (6)** Same course content as 37.130, supplemented by copious drills. Emphasis on pronunciation, fluency in common speech situations. Offered especially for German majors.
- 37.136 Intensive Elementary German II (6)** Continuation of 37.135.

- 37.145 Intensive Elementary Russian I (6)** Same course content as 37.140, supplemented by copious drills. Emphasis on pronunciation, fluency in common speech situations. Offered especially for Russian majors.
- 37.146 Intensive Elementary Russian II (6)** Continuation of 37.145.
- 37.155 Intensive Elementary Spanish I (6)** Same course content as 37.150, supplemented by copious drills. Emphasis on pronunciation, fluency in common speech situations. Offered especially for Spanish majors.
- 37.156 Intensive Elementary Spanish II (6)** Continuation of 37.155.
- 37.165 Intensive Elementary Japanese I (6)** Emphasis on audio-lingual skills. Drills on the main features of Japanese structure. Inductive presentation of grammar. Active vocabulary. Introduction to the writing system.
- 37.166 Intensive Elementary Japanese II (6)** Continuation of 37.165.
- 37.175 Intensive Elementary Arabic I (6)** Emphasis on audio-lingual skills. Drills on the main features of Classical Arabic structure. Inductive presentation of grammar. Active vocabulary. Introduction to the writing system.
- 37.176 Intensive Elementary Arabic II (6)** Continuation of 37.175.
- 37.185 Intensive Elementary Chinese I (6)** Emphasis on audio-lingual skills. Drill on the main features of Mandarin structure. Inductive presentation of grammar. Active vocabulary. Introduction to the writing system.
- 37.186 Intensive Elementary Chinese II (6)** Continuation of 37.185.
- 37.220 Intermediate French I (3)** Audio-lingual skills as well as reading and writing. Text material is focused on French cultural patterns. *Prerequisite:* One year college French, or qualifying examination.
- 37.221 Intermediate French II (3)** Continuation of 37.220.
- 37.230 Intermediate German I (3)** Audio-lingual skills as well as reading and writing. Text material is focused on German cultural patterns. *Prerequisite:* One year college German, or qualifying examination.
- 37.231 Intermediate German II (3)** Continuation of 37.230.
- 37.240 Intermediate Russian I (3)** Audio-lingual skills as well as reading and writing. Text material is focused on Russian cultural patterns. *Prerequisite:* One year college Russian, or qualifying examination.
- 37.241 Intermediate Russian II (3)** Continuation of 37.240.
- 37.250 Intermediate Spanish I (3)** Audio-lingual skills as well as reading and writing. Text material is focused on Spanish and Spanish-American cultural patterns. *Prerequisite:* One year college Spanish, or qualifying examination.
- 37.251 Intermediate Spanish II (3)** Continuation of 37.250.
- 37.225 Intensive Intermediate French I (5)** Offered especially for French majors. Same course content as 37.220, supplemented by copious drills. Discussions. *Prerequisite:* One year college French, or qualifying examination.
- 37.226 Intensive Intermediate French II (5)** Continuation of 37.225.

- 37.235 Intensive Intermediate German I (5)** Offered especially for German majors. Same course content as 37.230, supplemented by copious drills. Discussions. *Prerequisite:* One year college German, or qualifying examination.
- 37.236 Intensive Intermediate German II (5)** Continuation of 37.235.
- 37.245 Intensive Intermediate Russian I (5)** Offered especially for Russian majors. Same course content as 37.240, supplemented by copious drills. Discussions. *Prerequisite:* One year college Russian, or qualifying examination.
- 37.246 Intensive Intermediate Russian II (5)** Continuation of 37.245.
- 37.255 Intensive Intermediate Spanish I (5)** Offered especially for Spanish majors. Same course content as 37.250, supplemented by copious drills. Discussions. *Prerequisite:* One year college Spanish, or qualifying examination.
- 37.256 Intensive Intermediate Spanish II (5)** Continuation of 37.255.
- 37.300 Introduction to Language (3)** The nature of language. The field of linguistics. Languages of the world. Linguistic terminology.
- 37.322 Survey of French Literature I (3)** French literature from its beginnings to the Romantic period. Reading of texts from *Chanson de Roland* to Voltaire and Rousseau. *Prerequisite:* 37.221 or 37.226.
- 37.323 Survey of French Literature II (3)** French literature from Romanticism to the contemporary period. Readings from Chateaubriand to Camus. Emphasis on spiritual and intellectual heritage of each succeeding literary generation. *Prerequisite:* 37.322.
- 37.324 Classical French Literature (3)** The classical ideal during the reign of Louis XIV. Study centered on 17th century writers other than dramatists: Descartes, Pascal, Boileau, Bossuet, La Fontaine, La Rochefoucauld, and Fénelon. *Prerequisite:* permission of the instructor.
- 37.325 Classical French Drama (3)** Three great 17th century French dramatists: Corneille, Racine, and Molière. Study of humanistic values expressed in their masterpieces. *Prerequisite:* permission of the instructor.
- 37.332 Survey of German Literature I (3)** German literature from the Old High German period through the classical period to 19th century Romanticism. *Prerequisite:* 37.231 or 37.236.
- 37.333 Survey of German Literature II (3)** Movements in German thought in the 19th and 20th centuries. Selected writings. *Prerequisite:* 37.332.
- 37.334 Scientific German I (3)** Reading of selected scientific German texts. *Prerequisite:* permission of the instructor.
- 37.335 Scientific German II (3)** Continuation of 37.334.
- 37.343 Scientific Russian I (3)** Reading of selected scientific Russian texts. *Prerequisite:* permission of the instructor.
- 37.344 Scientific Russian II (3)** Continuation of 37.343.
- 37.345 Survey of Russian Literature I (3)** Russian literature from the Kiev period to Dostoevsky. *Prerequisite:* 37.241 or 37.246.
- 37.346 Survey of Russian Literature II (3)** Russian literature from Post-Dostoevsky Decadence to the present. *Prerequisite:* 37.345.

- 37.352 Survey of Spanish Literature I (3)** Spanish literature from the epic period to the 18th century. Readings from *Poema del Cid* through *Siglo de Oro*. *Prerequisite:* 37.251 or 37.256.
- 37.353 Survey of Spanish Literature II (3)** From Romanticism to the present. Readings from Duque de Rivas and Espronceda to Jiménez. *Prerequisite:* 37.352.
- 37.354 Modern Spanish Drama (3)** Representative plays by Echegaray, Benavente, Quintero Brothers, Marquina, Martínez Sierra, and García Lorca. *Prerequisite:* permission of the instructor.
- 37.355 Drama of the Golden Age (3)** Lope de Vega, Tirso de Molina, Ruiz de Alarcón, and Calderón de la Barca. *Prerequisite:* permission of the instructor.
- 37.420 French Civilization (3)** A survey of French civilization from Charlemagne to the present time. The course is conducted in French. *Prerequisite:* 37.221 or 37.226.
- 37.430 German Civilization (3)** A survey of German civilization from the beginning of the Christian era to the present time. The course is conducted in German. *Prerequisite:* 37.231 or 37.236.
- 37.450 Hispanic Civilization (3)** A survey of Hispanic Civilization from Roman times to the present. The course is conducted in Spanish. *Prerequisite:* 37.251 or 37.256.
- 37.427 Advanced French I (3)** Audio-lingual skills as well as reading and writing. Discussions. Systematic exercises on style. Idioms. Semantic problems. *Prerequisite:* Two years of college French, or qualifying examination.
- 37.428 Advanced French II (3)** Continuation of 37.427.
- 37.437 Advanced German I (3)** Audio-lingual skills as well as reading and writing. Discussions. Systematic exercises on style. Idioms. Semantic problems. *Prerequisite:* Two years of college German, or qualifying examination.
- 37.438 Advanced German II (3)** Continuation of 37.437.
- 37.447 Advanced Russian I (3)** Audio-lingual skills as well as reading and writing. Discussions. Systematic exercises on style. Idioms. Semantic problems. *Prerequisite:* Two years of college Russian, or qualifying examination.
- 37.448 Advanced Russian II (3)** Continuation of 37.447.
- 37.457 Advanced Spanish I (3)** Audio-lingual skills as well as reading and writing. Discussions. Systematic exercises on style. Idioms. Semantic problems. *Prerequisite:* Two years of college Spanish, or qualifying examination.
- 37.458 Advanced Spanish II (3)** Continuation of 37.457.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 700-level courses are open only to graduate students.)

- 37.500 Principles of Linguistics (3)** Introduction to the scientific study of language, with the emphasis on descriptive linguistics. Attitudes of the linguistic scientist. Readings, problems, and class discussions. (Offered every fall and summer.)
- 37.501 Linguistic Structure I (3)** Phonetics and phonemics. Techniques of describing speech sounds in terms of articulatory movements and formulas. Practice in hearing and transcribing phonetic sounds, using tape recordings. Basic premises underlying phonemic analysis and practical procedures for arriving at the phonemes of a language. (Offered every fall.)
- 37.502 Linguistic Structure II (3)** Morphology and syntax. The identification of morphemes; morphophonemics; morpheme classes and distribution; problems in the classification and description of morphological data. Componential analysis of utterances; form classes; immediate constituents. Introduction to string constituent analysis and transformations. *Prerequisite:* 37.501. (Offered every spring.)
- 37.505 History of Linguistics (3)** Linguistic theories from the Greeks to modern times. Great linguists and their schools of thought. Development of American linguistics. (Offered every spring.)
- 37.507 Applied Linguistics: Methodology of Foreign Language Teaching (3)** Principles underlying the structural method of language teaching. Application of linguistics in the preparation of teaching materials. Planning of courses. Audio-visual aids. (Offered every fall.)
- 37.508 Teaching English as a Foreign Language (3)** Methods of teaching English as a foreign language; development of teaching materials; discussion of textbooks; lesson planning; problems of the foreign student. A considerable portion of the course is devoted to practical work: writing materials and presenting them orally for class critique. Students visit actual EFL classes. *Prerequisite:* 37.507 or permission of the instructor. (Offered every spring.)
- 37.520 The French Renaissance (3)** Renaissance and humanistic movement in France in the 16th century. Rabelais, the *Pléiade*, Ronsard, Montaigne. *Prerequisite:* permission of the instructor.
- 37.521 18th Century France: Men and Ideas (3)** Attitudes and ideas of the age of enlightenment as reflected in Montesquieu, Diderot, the Encyclopedists, Voltaire, and Rousseau. *Prerequisite:* permission of the instructor.
- 37.522 French Romanticism (3)** Development of the Romantic movement in early 19th century French literature. Analysis of sentiments of the romanticists. *Prerequisite:* permission of the instructor.
- 37.523 French Realism (3)** 19th century French literature from decline of romanticism to turn of century. Periods of expression known as realism, naturalism, and symbolism. *Prerequisite:* permission of the instructor.

- 37.524 Contemporary French Theater (3)** Representative plays of Paul Claudel, Jules Romains, Jean Jacques Bernard, Jean Giraudoux, Henri de Montherlant, Jean Paul Sartre, Jean Anouilh, and Albert Camus. *Prerequisite:* permission of the instructor.
- 37.525 Contemporary French Novels (3)** Major trends in the French novel since 1919. J. Romains, Mauriac, Duhamel, Gide, Malraux, Giraudoux, du Gard, Fournier, Proust, Sartre, and Camus. *Prerequisite:* permission of the instructor.
- 37.530 German Classical Period (3)** German literature from rationalism and the English influence to transition from classicism to romanticism. Lessing, Herder, Goethe, Schiller, Kant, and Fichte. *Prerequisite:* permission of the instructor.
- 37.531 Lessing (3)** Lessing as representative of 18th century thought in Germany. Foundations of modern German drama. Preparation for work of Kant. Nature of "Aufklärung." Humanistic ideals. *Prerequisite:* permission of the instructor.
- 37.532 Goethe (3)** Life, time, and representative works of Goethe. Reading of *Faust*. *Prerequisite:* permission of the instructor.
- 37.533 Schiller (3)** Life, time, and representative works of Schiller. His ideas as expressed in drama. Moral and artistic standards. *Prerequisite:* permission of the instructor.
- 37.540 Pushkin (3)** The life and work of Alexander Pushkin. Reading and interpretation of some of his works, with particular emphasis on *Eugene Onegin*. *Prerequisite:* permission of the instructor.
- 37.541 Dostoevsky (3)** The life and work of Fëdor Dostoevsky. Reading and interpretation of some of his works, with particular reference to *Crime and Punishment* and *The Devils*. *Prerequisite:* permission of the instructor.
- 37.542 Tolstoy (3)** The life and work of Leo Tolstoy. Critical study of *Anna Karenina*. Tolstoy's social and ethical ideas in relation to his contemporary world. *Prerequisite:* permission of the instructor.
- 37.543 The Russian Theater (3)** Development of the Russian theater from Pushkin's time through the Soviet period. Evaluation of plays by Pushkin, Gogol, Ostrovsky, Chekhov, and samples from Soviet dramatists. *Prerequisite:* permission of the instructor.
- 37.550 Novel of the Golden Age (3)** The development of the novel during the Golden Age with special emphasis on *Don Quijote*. *Prerequisite:* permission of the instructor.
- 37.551 Spanish 19th Century Novel (3)** Trends of the novel from romanticism to the generation of '98. Alarcón, Valera, Pereda, Pardo Bazán, Pérez Galdós and others. *Prerequisite:* permission of the instructor.
- 37.552 Latin-American Literature I (3)** Literary and historical figures from the chronicles to the 19th century. Collateral readings in 19th century Brazilian literature may be included. *Prerequisite:* permission of the instructor.

- 37.553 Latin-American Literature II (3)** From the development of the modernist movement to contemporary literature. Collateral readings in Brazilian literature of the same period may be included. *Prerequisite:* permission of the instructor.
- 37.559 Contemporary Spanish Literature (3)** Generation of 1898 and contemporary poets, novelists, dramatists, and critics. *Prerequisite:* permission of the instructor.
- 37.700 Seminar in Contemporary German Literature I (3)** Reports and critical discussion of research papers on 20th century German literature. The seminar is conducted entirely in German. *Prerequisite:* permission of the instructor.
- 37.701 Seminar in Contemporary German Literature II (3)** Continuation of 37.700.
- 37.702 Seminar in Contemporary French Literature I (3)** Reports and critical discussion of research papers on 20th century French literature. The seminar is conducted entirely in French. *Prerequisite:* permission of the instructor.
- 37.703 Seminar in Contemporary French Literature II (3)** Continuation of 37.702.
- 37.704 Seminar in Contemporary Spanish and Latin-American Literature I (3)** Reports and critical discussion of research papers on modern Spanish and Latin-American literature. The seminar is conducted entirely in Spanish. *Prerequisite:* permission of the instructor.
- 37.705 Seminar in Contemporary Spanish and Latin-American Literature II (3)** Continuation of 37.704.
- 37.706 Seminar in Russian Pre-revolutionary Literature I (3)** Reports and critical discussion of research papers on Russian pre-revolutionary literature. The seminar is conducted entirely in Russian. *Prerequisite:* permission of the instructor.
- 37.707 Seminar in Russian Pre-revolutionary Literature II (3)** Continuation of 37.706.
- 37.710 Seminar in Linguistics (3)** No fixed subject content. Reports and critical discussions on various theoretical and practical problems in the scientific study of language, methodology in linguistic research, and other pertinent linguistic subjects. May be repeated for credit. *Prerequisite:* permission of the instructor. (Offered every fall and spring.)
- 37.797 Master's Thesis Seminar (3-6).**

PHILOSOPHY AND RELIGION

Professors: HAROLD A. DURFEE (Chairman); RALPH C. JOHN (Dean, College of Arts and Sciences). *Visiting Professor:* Y. H. KRIKORIAN. *Associate Professors:* EDWARD W. BAUMAN; THEODORE R. ROSCHE; ROGER T. SIMONDS. *Assistant Professor:* ROBERT C. LESTER. *Instructors:* PAUL J. JOHNSON; JOHN W. RAPCHAK. *Professorial Lecturers:* GEORGE W. BUCHANAN; ISAAC FRANCK; CHRISTOPHER B. GARNETT, JR. *Lecturer:* EUGENE J. LIPMAN.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements38-43 hours

Language Requirement (French or German) 12 hours

Through the intermediate year.

Departmental Requirements:

BACHELOR OF ARTS IN PHILOSOPHY

Major Courses 27 hours

Students majoring in Philosophy complete 47.100 Logic and the Scientific Method, and 24 hours in Philosophy at the 300-level and above, including 47.300-301 History of Philosophy.

Minor Department (Courses at the 300-level and above) 12 hours

Electivesto complete 126 hours

BACHELOR OF ARTS IN RELIGION

Major Courses 30 hours

Students majoring in Religion complete 47.150 Introduction to the Old Testament and 47.170 Introduction to the New Testament, 21 additional hours in Religion, and three hours of Philosophy.

Minor Department (Courses at the 300-level and above) 12 hours

Electivesto complete 126 hours

BACHELOR OF ARTS IN PHILOSOPHY AND RELIGION

Major Courses 33 hours

Students completing a combined major in Philosophy and Religion complete 47.150 Introduction to the Old Testament; 47.170 Introduction to the New Testament; 47.300-301 History of Philosophy, and 21 additional hours in Philosophy and Religion chosen from 300-level courses and above. These 21 hours are to be divided with 12 hours in one field, including at least one course at the 500-level, and nine hours in the other field.

Minor Department (Courses at the 300-level and above) 12 hours

Electivesto complete 126 hours

Graduate Degrees—Master of Arts in Philosophy or Religion

MASTER OF ARTS IN PHILOSOPHY

Course Requirements: Minimum of 30 hours of approved graduate work, including 47.798 Master's Thesis Seminar (6).

Written Comprehensive Examination: One eight hour examination in Philosophy.

Other Requirements: Proficiency examination in French or German. Thesis and oral defense of thesis.

MASTER OF ARTS IN RELIGION

Course Requirements: Minimum of 30 hours of approved graduate work, including 47.797 Master's Thesis Seminar (6).

Written Comprehensive Examinations: Three, including one in the History of Religion with special emphasis upon a selected non-Christian religion, one in the English Bible with special emphasis upon a selected author, and one in the History of Christian Thought with special emphasis upon a selected classical figure, or a related field.

Other Requirements: Proficiency examination in French, German, Greek, or Hebrew. Thesis and oral defense of thesis.

Graduate Comprehensive Examination Fields

PHILOSOPHY

47.1 Philosophy

RELIGION

47.3 History of Religion (with special emphasis upon a selected non-Christian religion), 47.4 English Bible (with special emphasis upon a selected author), 47.21 History of Christian Thought (with special emphasis upon a selected classical figure in the same).

UNDERGRADUATE COURSES

PHILOSOPHY

- 47.100 Logic and the Scientific Method (3)** Introduction to the nature of valid inference and its relation to the scientific method. Principles of inductive and deductive reasoning.
- 47.101 Introduction to Philosophy (3)** Questions man has asked about himself, the world, and the origin, purpose and destiny of life; representative answers given by the great thinkers.
- 47.102 Philosophies Men Live By (3)** A study of selected philosophers in the history of western thought, and their relevance to human existence.
- 47.300 History of Philosophy: Ancient and Medieval (3)** Historical survey of representative philosophers from the early Greeks through the Middle Ages. Not open to Freshmen.
- 47.301 History of Philosophy: Modern (3)** Philosophers from the Renaissance to Hegel. Not open to Freshmen.

- 47.302 History of Philosophy: Recent (3)** Philosophers from Hegel to contemporary Existentialism and Linguistic analysis. Not open to Freshmen.
- 47.303 American Philosophy (3)** Backgrounds and substance of American philosophy since colonial times. Role of philosophical ideas, European and indigenous, in the growth of the American culture. *Prerequisite:* three hours of philosophy.
- 47.305 Philosophies of the East (3)** Systems of thought in the East from ancient to modern times. Special emphasis upon philosophies of Confucianism, Taoism, Hinduism, and Buddhism.
- 47.310 Ethics (3)** Inquiry into the principles of moral evaluation, their relation to factual judgment, and individual and social behavior. Evaluation of traditional schools and theories of ethics. *Prerequisite:* three hours of philosophy.
- 47.311 Aesthetics (3)** Nature of beauty and the relation of the philosophy of the beautiful to the fine arts and to human experience. *Prerequisite:* three hours of philosophy.

RELIGION

BIBLICAL STUDY

- 47.150 Introduction to the Old Testament (3)** Emphasis upon the substantive content of the Bible. Special attention to the historical method and the canon of Biblical interpretation.
- 47.170 Introduction to the New Testament (3)** A literary, historical and theological study of the New Testament with particular attention upon Jesus, Paul and the development of the Christian movement.

CHRISTIAN THOUGHT

- 47.370 History of Christian Thought I (3)** Survey of Christian thought from apostolic times through medieval period to Erasmus. Special attention to the rise of orthodoxy and heresy, in representative thinkers and councils.
- 47.371 History of Christian Thought II (3)** Analysis of the thought of the Protestant and Roman Catholic Reformations of the 16th century. The development and place of Christian ideas in the rise of modern secular culture.
- 47.374 Christian Ethics (3)** Study of the major types and issues of Christian ethical thought. *Prerequisite:* Three hours of philosophy or religion.
- 47.375 Studies of Major Theologians (3)** For fall 1963-64, Augustine. *Prerequisite:* Three hours of religion or philosophy.
- 47.376 Christian Belief (3)** Christian apologetics and its place in the intellectual interest of modern man. Introductory examination of Christian beliefs about God, the Bible, revelation, human nature, and destiny. *Prerequisite:* Three hours of religion or philosophy.
- 47.380 Psychology of Religion (3)** Psychological appraisal of religious experience, prayer, worship, belief, interpersonal relationships, religious practices and behavior.

HISTORY OF RELIGION

- 47.383 Comparative Religion (3)** Synoptic study of the world's living religions, their founders, literature, teachings and values.
- 47.394 Post-Biblical Judaism (3)** The development of Judaism from the Maccabean period to the present. Selected philosophical, theological, institutional movements in Jewish faith and practice. *Prerequisite:* 47.150.
- 65.430 Primitive Religions (3)** Varieties of religious experiences and expressions, exclusive of the great world religions. Role of religion in influencing behavior and in integrating particular societies, cultures. *Prerequisite:* 65.201.

Library Reference Room



ADVANCED COURSES

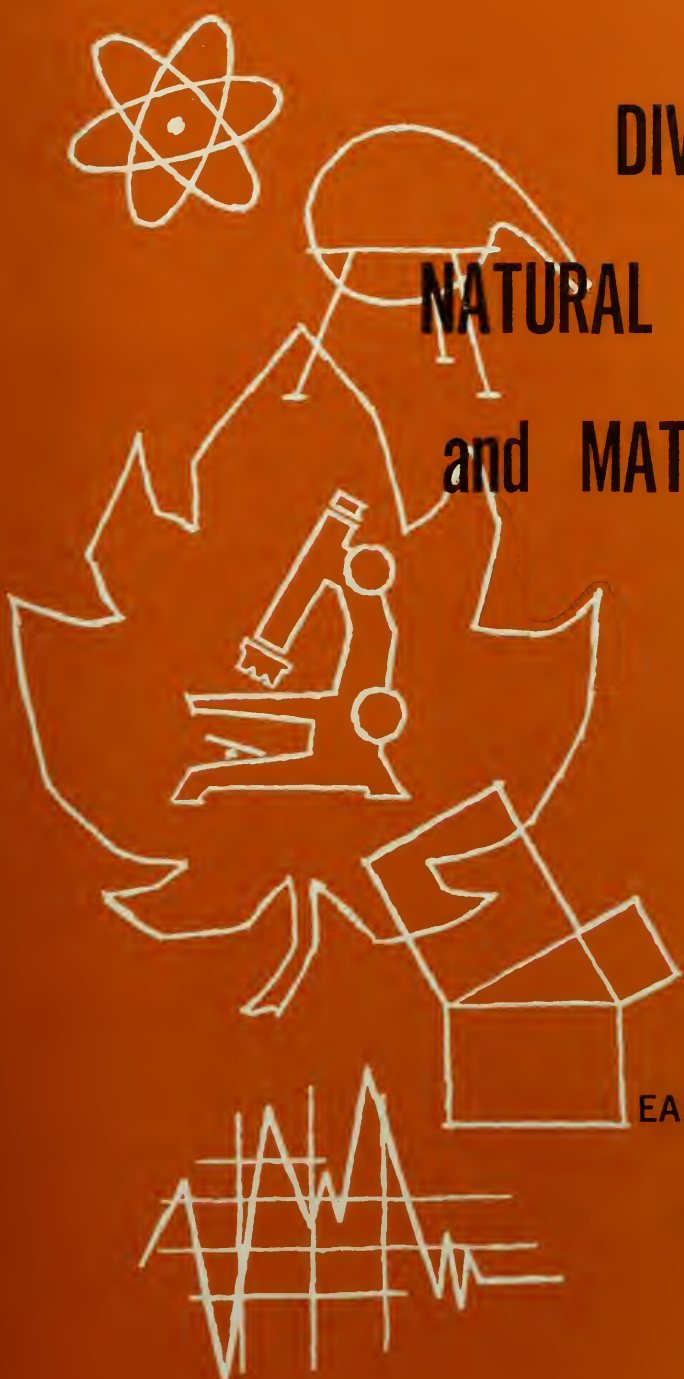
(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

PHILOSOPHY

- 47.500 Studies in Major Philosophers (3)** Reading and analysis of leading historical philosophers. For fall 1963-64, the British empiricists. For spring 1964, Early Modern Rationalists. *Prerequisite:* six hours of philosophy.
- 47.502 Studies in Recent Philosophy (3)** Reading and analysis of selected philosophers since Hegel as the background of contemporary philosophical movements. For fall 1963-64, Husserl, Kierkegaard, and William James. *Prerequisite:* six hours of philosophy.
- 47.504 Contemporary Philosophy (3)** Study of a leading contemporary movement in philosophy. *Prerequisite:* six hours of philosophy.
- 47.506 Selected Topics in Philosophical Analysis (3)** A study of selected issues in philosophy. For fall 1963-64, Value Theory. *Prerequisite:* six hours of philosophy.
- 47.508 Philosophy of Religion (3)** Study of a leading contemporary movement in Philosophy of Religion. For spring 1964, Neo-orthodoxy. *Prerequisite:* six hours of philosophy.
- 47.520 Symbolic Logic (3)** An analysis of the development and use of symbolism in modern logic and its relevance to the clarification of logical problems. *Prerequisite:* 47.100.
- 47.521 Philosophy of Science (3)** A study of the relationship of modern philosophy to the findings of modern science. *Prerequisite:* 47.100.
- 47.530 Social Philosophy (3)** A study of the leading proposals regarding the philosophical foundation of modern culture and society. *Prerequisite:* three hours of philosophy.
- 29.504 Philosophy of History (3)** Contemporary issues in the philosophy of history, with special attention to problems of meaning and structure in the historical process, considered in the light of their historical roots. *Prerequisite:* three hours of philosophy.
- 47.602 Graduate Seminar in Philosophy (3)** An intensive study of selected philosophical problems. For fall 1963-64, Theories of Natural Law. *Prerequisite:* 12 hours of philosophy.
- 47.798 Master's Thesis Seminar (3-6)** Directed research of M. A. thesis proposals.

RELIGION

- 47.550 Studies In Non-Christian Religions (3)** A study of the theology and literature of non-Christian religious movements. For fall 1963-64, Islam; for spring 1964, Taoism, Confucianism, Shintoism. *Prerequisite:* 47.305 or 47.383.
- 47.560 Selected Biblical Studies (3)** Study of selected topics in Biblical literature. For fall 1963-64, Old Testament Prophetic Literature. *Prerequisite:* three hours of Biblical studies.
- 47.797 Master's Thesis Seminar (3-6)** Directed research of M. A. thesis proposals.



DIVISION OF
NATURAL SCIENCES
and MATHEMATICS

BIOLOGY
CHEMISTRY
EARTH SCIENCES
PHYSICS
MATHEMATICS
STATISTICS

BIOLOGY

Professors: SUMNER O. BURHOE (Chairman); ALFRED B. CHAET. *Associate Professor:* MARTHA C. SAGER. *Associate Professor in Research:* EDWARD J. BREYER. *Assistant Professor:* PAUL R. CURTIS. *Instructor:* JEAN S. MORTON. *Adjunct Professors:* OSCAR B. HUNTER, JR.; HERBERT SEVERSMITH. *Professorial Lecturers:* NELLIE BERING; MARK H. CONNER; GERALD KLEBANOFF; PHILIP ROSS. *Lecturers:* JOHN DAVIDSON; JOSEPH C. HWANG.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Science

BACHELOR OF SCIENCE IN BIOLOGY

The Department of Biology provides basic training in zoological and botanical fields, emphasizing bacteriology, botany, embryology, genetics, physiology, and other specialized fields of study. The curriculum is planned for those with a professional interest in any one of several of the biological sciences and also prepares the student for continued work at the graduate level.

SECONDARY SCHOOL TEACHER TRAINING

The Department of Biology, in cooperation with the Department of Education, also offers a special curriculum which will lead to certification for teaching Biology at the high school level. Students who have selected this as their vocational objective should see the teacher education adviser in the Biology Department during the second semester of the Freshman year.

MEDICAL TECHNOLOGY

A curriculum in Medical Technology is offered for students intending to follow this career. This program combines courses which lead to the Bachelor of Science degree with training in Medical Technology. The Senior year is spent in professional training at the Oscar B. Hunter Medical Technology Laboratory.

University Requirements **38-43 hours**

Language Requirement (French, German, or Russian) **12 hours**

Departmental Requirements:

Major Courses **40 hours**

9.110 General Zoology (4), 9.111 General Botany (4), 9.203 General Bacteriology (4), 9.204 Comparative Vertebrate Anatomy (4), 9.304 Biology Journal Literature (2), 9.307 Genetics (3), 9.315 Vertebrate Embryology (4), 9.322 General Physiology (4), and 11 additional hours.

Related Courses **26 hours**

15.110 and 15.111 General Chemistry I and II (8), 15.310, 15.311, 15.320, 15.321 Organic Chemistry I and II (10), 51.210 and 51.211 Elements of General Physics I and II (8).

Tool Courses **6 hours**

41.110 and 41.111 Fundamentals of Mathematics I and II (6).

Electives **to complete 126 hours**

Other Undergraduate Degrees

See page 82 for information concerning requirements for the Bachelor of Science with major in distributed sciences.

Graduate Degree—Master of Science

Course Requirements: Minimum of 30 hours of approved graduate work, including 9.797 Master's Thesis Seminar (6).

Written Comprehensive Examinations: Two, selected from the fields listed below.

Other Requirements: Proficiency examination in technical German, French, or Russian. Thesis and oral defense of thesis.

Other Graduate Degrees

See page 82 for information concerning requirements for the Master of Science in Science Teaching.

Graduate Comprehensive Examination Fields

9.1 Bacteriology, 9.2 Botany, 9.3 Embryology, 9.4 Genetics, 9.5 Physiology, 9.6 Zoology.

UNDERGRADUATE COURSES

- 9.100 Human Biology (3)** Nature of living organisms. Structure, development, and functions of animals with special attention to man. Demonstrations. Three hours of lecture. No laboratory.
- 9.110 General Zoology (4)** Structure, function, development, life histories, classification, heredity, and evolution of animals. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10.
- 9.111 General Botany (4)** Structure, function, and development of plants. Survey of plant kingdom. Study of campus woodland. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10.
- 9.203 General Bacteriology (4)** Bacteria and their relationship to human welfare. Culture methods; principles of sterility; aseptic techniques. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* eight hours of biology and twelve hours of chemistry.
- 9.204 Comparative Vertebrate Anatomy (4)** Classification and comparative anatomical studies of selected organ systems of certain important vertebrate groups. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* one year of biology.
- 9.205 Comparative Plant Anatomy (4)** Comparative studies of anatomical features of angiosperms. Evolutionary trends in the development of these features. Taxonomic uses of these features and economic values. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* one year of biology.
- 9.301 Human Physiology (4)** Functions of the vertebrate organ systems with special reference to those of man. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* one year of biology and one year of chemistry.

- 9.304 Biology Journal Literature (2)** Consideration of current developments and research in biology. Reviews, reports, discussions of articles in scientific publications. Three hours of lecture and discussion. *Prerequisites:* 12 hours of biology and one year of chemistry.
- 9.307 Genetics (3)** Principles of heredity and variations in animals and plants. Problems to illustrate Mendelian inheritance. Three hours of lecture. *Prerequisite:* 12 hours of biology.
- 9.315 Vertebrate Embryology (4)** Mechanics of development. Formation of germ cells, fertilization, cleavage of the fertilized ovum, morphogenesis, and later development of the frog, chick, and pig. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 12 hours of biology.
- 9.322 General Physiology (4)** The properties and physiological processes common to all animals, such as protoplasmic organization, permeability, metabolism, movement, reproduction, and cell division. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 12 hours of biology and 16 hours of chemistry.
- 9.410 Invertebrate Zoology (4)** Morphology, physiology, and evolutionary relationships of invertebrate animals. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 12 hours of biology.
- 9.415 Biological Techniques (4)** Fundamental techniques in the preparation of microscopic slides of plant and animal tissues. Whole mounts. Microphotography. Embedding in plastics. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 12 hours of biology and permission of Department Chairman.
- 9.450 Advanced Biological Studies (4)** Introduction to research provided for competent students in field of special interest. Laboratory fee, part-time students, \$10. Offered to meet the needs of individual students. *Prerequisite:* permission of Department Chairman.
- 9.460 Clinical Laboratory Practice (10)** Six-month apprentice experience in laboratory of a hospital affiliated with the University in its Medical Technology Program. *Prerequisite:* senior in Medical Technology. May be taken twice for credit. Hours arranged.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

- 9.503 General Entomology (4)** Morphology, life history, classification, and economic importance of insects. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* senior or graduate in biology.
- 9.506 Plant Taxonomy (4)** Study of Thallophyta, Bryophyta and Vascular Plants from an ecological, phylogenetic and taxonomic viewpoint. Extensive field trips. Laboratory to include preparation of herbarium specimens, techniques in preserving plants and in making cytological sections. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 9.111 General Botany; 9.205 Comparative Plant Anatomy; or permission of the Department; senior or graduate.

- 9.514 Animal Histology (4)** Structures and properties of cells. Microscopic study of tissues and organs of representative mammals, including man. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* senior or graduate in biology.
- 9.517 Bio-Ecology (4)** Study of local animals and plants and their adaptation, geographical distribution, behavior, relationship to environment. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* senior or graduate in biology.
- 9.518 Parasitology (4)** Parasites and their relationships to disease and human welfare. Life histories, morphology, identification, and parasitological preparations. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* senior or graduate in biology.
- 9.521 Modern Advances in Genetics (3)** Genetic findings as applied to modern civilization; causes of mutations; detrimental mutations in man, medical genetics; radiation effects and fall out. Important mutations in man, domestic animals and plants. Three hours of lecture. *Prerequisite:* 12 hours of biology including 9.307 Genetics.
- 9.530 Biological Designs I (4)** Biological correlation with biochemical and biophysical mechanisms. Especially designed for the teacher of advanced biology in the secondary school. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 12 hours of biology.
- 9.531 Biological Designs II (4)** Use of instrumentation in measuring and interpreting physiological phenomena. Especially designed for the teacher of advanced biology in the secondary school. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 12 hours of biology.

Leonard Center



- 9.532 Advanced Bacteriology (4)** Role of micro-organisms in disease; their importance in infection and resistance; fundamental laboratory techniques used in the field of bacteriology with special emphasis on clinical laboratory methods and diagnostic immunological reactions. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 12 hours in biology including 9.203 General Bacteriology, and Organic Chemistry.
- 9.534 Virology (4)** The nature and properties of plant, animal, and bacterial viruses. Laboratory techniques for cultivation and manipulation of viruses will be undertaken. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students \$10. *Prerequisites:* 9.203 General Bacteriology, one year of Organic Chemistry, senior or graduate in biology.
- 9.560 Endocrinology (4)** The structure and function of the endocrine glands with emphasis on their control of biological processes. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 9.322 General Physiology and senior or graduate in biology.
- 9.562 Comparative Physiology (4)** Physiological variations found in the animal kingdom and an interpretation of these variations in terms of evolutionary significance, anatomical changes, ecological conditions. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 9.322 General Physiology and senior or graduate in biology.
- 9.616 Plant Physiology (4)** A survey of the general physiological activities of plants with emphasis on the biochemical nature of photosynthesis; normal activities of plant growth; plant metabolism and tropical responses. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 9.322 General Physiology, 9.205 Plant Anatomy and graduate in biology.
- 9.620 Experimental Embryology (4)** Mechanics of fertilization and growth. A review of important contributions in the field of experimental embryology. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 9.315 Vertebrate Embryology, 9.322 General Physiology and graduate in biology.
- 9.621 Advanced Genetics (4)** A consideration of salivary chromosomes, the nature of the gene, chromosomal irregularities, polyploidy, and mutations. Breeding experiments with *Drosophila* and small mammals will be conducted. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 9.307 Genetics and graduate in biology.
- 9.632 Bacterial Genetics (4)** An introduction to genetic principles applicable to bacteria and viruses. Mutation, recombination, transformation, conversion, transduction, bacteriophage. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 9.203 General Bacteriology, 9.307 Genetics, and graduate in biology.

9.664 Cellular Physiology (4) A study of physiology from the cellular point of view, emphasizing the functions of the various cellular components such as chromosomes, mitochondria, membranes, nuclear, cytoplasmic interactions, chloroplasts. Two hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 9.322 General Physiology and graduate in biology.

9.797 Master's Thesis Seminar (3-6).



CHEMISTRY

Professors: MARY H. ALDRIDGE; FREDERICK A. H. RICE; LEO SCHUBERT (Chairman). *Research Professor:* EDUARD FARBER. *Associate Professors:* BERNARD MILLER, JAMES S. SWINEHART. *Assistant Professor:* ANN B. BRAUN. *Instructor:* DORIS E. HADARY. *Adjunct Professors:* DANIEL BANES; KEITH C. JOHNSON; ANDREJ MACEK; WILFRID B. MANN; JOHN K. TAYLOR; ALFRED WEISSLER. *Professorial Lecturers:* BENJAMIN H. ALEXANDER; IRVING BREGER; WILLIAM J. CAMPBELL; ALAN H. MEHLER; WILLIAM A. ZISMAN. *Lecturers:* LLOYD CURRIE; JEAN ROTHERHAM; WILLIAM J. WHELAN. *Research Associate:* WILSON L. SCOTT.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Science

University Requirements 38-43 hours

Students majoring in chemistry are required to complete 51.220 and 51.221 Fundamentals of General Physics I and II (10) as part of their University requirements.

Language Requirement (German) 12 hours

Departmental Requirements:

Major courses 43-47 hours

15.110 and 15.111 General Chemistry I and II (8) *or* 15.200 Chemical Principles (4), 15.210 Qualitative Inorganic Analysis (3), 15.211 Qualitative Inorganic Analysis Laboratory (1), 15.310, 15.311, 15.320, 15.321 Organic Chemistry I and II (10), 15.350 and 15.351 Quantitative Analysis (5), 15.400 and 15.401 Physical Chemistry I and II (8), 15.460 and 15.461 Instrumental Quantitative Analysis (5), 15.507 Chemical Literature (1), 15.550 Advanced Inorganic Chemistry I (3), and three additional hours in an approved 500-level course.

Related courses 8 hours

Laboratory course in biology (4), laboratory course in earth sciences (4).

Tool courses 14 hours

41.110 and 41.111 Fundamentals of Mathematics I and II (6), 41.222 and 41.223 Differential and Integral Calculus I and II (8).

Electives to complete 126 hours

The student is urged to consider 41.568 Computer Programming I as an elective.

Other Undergraduate Degrees

See page 82 for information concerning requirements for the Bachelor of Science with major in distributed sciences.

Graduate Degree—Master of Science

Course Requirements: Minimum of 30 hours of approved graduate work, including 15.797 Master's Thesis Seminar (6) and 15.700 Seminar in Chemistry

(1). Before this degree is awarded, the student must have completed, either in graduate or undergraduate school, two semesters of Advanced Inorganic Chemistry, two semesters of Advanced Organic Chemistry, one semester of Chemical Thermodynamics (or equivalent), one semester of Qualitative Organic Analysis, and one semester of Chemical Literature.

Written Comprehensive Examinations: Two, selected from the fields listed below.

Other Requirements: Proficiency examination in technical German, Russian, or French. Thesis and oral defense of thesis.

Other Graduate Degrees

See page 82 for information concerning requirements for the Master of Science in Science Teaching.

Graduate Comprehensive Examination Fields

15.1 Biochemistry, 15.2 Organic Chemistry, 15.3 Inorganic and Nuclear Chemistry, 15.4 Physical Chemistry, 15.5 Analytical Chemistry.

UNDERGRADUATE COURSES

- 15.100 Science of Chemistry (3)** Science and human experience. Structure of the atom, the molecule, bonds and their properties. Reactions and equilibria. Organic and biochemical processes. Kinetic molecular theory, radioactivity. Demonstrations. No laboratory. (Not for science majors.)
- 15.110 General Chemistry I (4)** A basic course for those with little or no chemistry background. Matter, energy, and chemical change. Atomic theory and chemical bonding. The states of matter. Solutions and ionization. Three hours of lecture, three and one-half hours of laboratory work. Laboratory fee, part-time students, \$10.
- 15.111 General Chemistry II (4)** Kinetics and equilibrium. Electrochemistry. The elements and their compounds treated systematically. Nuclear chemistry and radioactivity. Laboratory work includes qualitative analysis. Laboratory fee, part-time students, \$10.
- 15.200 Chemical Principles (4)** An advanced placement course for those with good background in high school chemistry. Emphasis on the theories of general chemistry. Students must complete the year's work with 15.210 and 15.211. Three hours of lecture; one hour of recitation; three hours of laboratory project work. Laboratory fee, part-time students, \$10.
- 15.210 Qualitative Inorganic Analysis (3)** Inorganic solution chemistry. *Prerequisite:* 15.111 or 15.200.
- 15.211 Qualitative Inorganic Analysis Laboratory (1)** Practice of the separation and characterization of the more familiar ions. Students who have had 15.111 need not take this course. Three hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 15.200.

- 15.310 Organic Chemistry I (3)** Systematic and theoretical treatment of aliphatic and aromatic hydrocarbons, alcohols, halides, and ethers. Ionic and free radical reactions. Stereochemistry. Must be taken concurrently with 15.311. *Prerequisite:* 15.111 or 15.210.
- 15.311 Organic Chemistry I Laboratory (2)** Laboratory theory and practice in synthesis. Introduction to organic qualitative analysis. Must be taken concurrently with 15.310. Six hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 15.111 or 15.210.
- 15.320 Organic Chemistry II (3)** Aliphatic and aromatic acids, nitrogen compounds, carbonyls, and their derivatives. Introduction to polyfunctional compounds. Must be taken concurrently with 15.321. *Prerequisite:* 15.310.
- 15.321 Organic Chemistry II Laboratory (2)** Synthesis of polyfunctional compounds. Qualitative organic analysis. Introduction to infrared techniques. Must be taken concurrently with 15.320. Six hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 15.311.
- 15.350 Quantitative Analysis (3)** Theory of gravimetric and volumetric analysis. The balance. Statistical analysis of data. Must be taken concurrently with 15.351. *Prerequisite:* 15.320.
- 15.351 Quantitative Analysis Laboratory (2)** Practice of gravimetric and volumetric analysis. Must be taken concurrently with 15.350. Six hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 15.321.
- 15.400 Physical Chemistry I (4)** Principles of theoretical chemistry. Thermodynamics, thermochemistry, and the states of matter. Chemical equilibria. Kinetics. Molecular structure. Three hours of lecture, four hours of laboratory a week. Laboratory fee, part-time students, \$10. *Prerequisites:* 15.210, 51.221, 41.223.
- 15.401 Physical Chemistry II (4)** Phase equilibria, properties of solutions, electrolytes and electromotive force. The activity concept for non-ideal systems. Colloids, macromolecules, and surface chemistry. Radiation chemistry. Three hours of lecture, four hours of laboratory a week. Laboratory fee, part-time students, \$10. *Prerequisite:* 15.400.
- 15.460 Instrumental Quantitative Analysis (3)** Theory of optical, electroanalytical, ion exchange and other modern instrumental methods. Analytical separations. The complete analysis. Must be taken concurrently with 15.461. *Prerequisites:* 15.350 and 15.401.
- 15.461 Instrumental Quantitative Analysis Laboratory (2)** Practice of optical, electroanalytical, ion exchange and other modern instrumental methods. Must be taken concurrently with 15.460. Six hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 15.351 and 15.401.
- 15.009 Glassblowing (No credit)** Demonstrations and laboratory practice in the repair, operation, and construction of glass apparatus. Permission of Department required. One hour of demonstration, three hours of laboratory. Laboratory fee, all students, \$60.00.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

- 15.507 Chemical Literature (1)** Survey and practice of reference, journal, and source literature. Required of undergraduate chemistry majors. *Prerequisites:* 15.320 and 15.350.
- 15.510 Advanced Inorganic Analytical Chemistry (3)** Systematic treatment of modern analytical methods and separations. *Prerequisite:* 15.460.
- 15.513 Electroanalytical Chemistry (3)** Electrochemical theory and ionic equilibria. E M F and pH. Conductometric, oscillometric, electrographic, coulometric, polarographic and amperometric analysis. Controlled potential analysis and potentiometric titrations. *Prerequisite:* 15.460.
- 15.519 Inorganic Preparations (3)** The theory and practice of inorganic preparations. Synthesis of representative compounds. One hour of lecture, six hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 15.460 and 15.550.
- 15.520 Advanced Organic Chemistry I (3)** Theoretical and systematic organic chemistry. Stereochemistry and electronic effects. Ionic and free radical reactions. *Prerequisites:* 15.320 and 15.401.
- 15.521 Advanced Organic Chemistry II (3)** Theoretical and systematic organic chemistry. Rearrangements and aromatic chemistry. Steroids. *Prerequisite:* 15.520.
- 15.522 Qualitative Organic Analysis (3)** Identification of organic compounds including classical procedures and modern techniques such as infrared analysis. Separation and identification of organic mixtures. One hour of lecture, six hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 15.320, 15.211, 15.507.
- 15.523 Organic Preparations (3)** Preparative methods of organic chemistry. Emphasis on techniques such as vacuum distillation, chromatography, extractions. Preparations from the original literature. One hour of lecture, six hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 15.520.
- 15.542 Chemical Kinetics (3)** Order and molecularity of reactions. Activated complex; theory for elementary reactions. Reactions in solutions and on surfaces. Complex reaction mechanisms. Non-isothermal kinetics. *Prerequisite:* 15.400.
- 15.543 Quantum Chemistry and Chemical Bonding (3)** Elementary wave mechanics. Interpretations of atomic spectra. Valence-bond and molecular orbital concepts. *Prerequisite:* 15.401.
- 15.544 Molecular Structure and Molecular Spectra (3)** Interpretations of electronic, rotational and vibrational spectra as they apply to molecular structure. *Prerequisite:* 15.401.
- 15.546 Chemical Thermodynamics (3)** Concepts of temperature, thermodynamic properties, specific heats. The Laws of Thermodynamics; their application to thermochemistry, chemical equilibrium and phase changes. *Prerequisite:* 15.401.

- 15.550 Advanced Inorganic Chemistry I (3)** Theoretical inorganic chemistry, including atomic and molecular structure, coordination chemistry, non-aqueous systems, related matters. *Prerequisites:* 15.350 and 15.401.
- 15.551 Advanced Inorganic Chemistry II (3)** Nuclear structure, radioactivity, acids, chemistry of the less familiar elements. *Prerequisite:* 15.550.
- 15.556 Radiochemistry (3)** Radioactivity, isotopes, fundamental particles of matter, tracer chemistry. Instrumentation used for radioactivity. Two hours of lecture, two hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 15.400.
- 15.560 Biochemistry I (4)** The chemistry of carbohydrates, proteins, and fats. Blood and respiration. Renal function and acid-base balance. Three hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 15.320 and 15.401.
- 15.561 Biochemistry II (4)** General properties of enzymes. Biological oxidation. Metabolism of carbohydrates, proteins and fats. Three hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 15.560.
- 15.568 Physiological Chemistry (4)** An introductory course in biochemistry for the non-chemistry major. Three hours of lecture, four hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 15.320 and 9.322.
- 15.580 History of Chemistry (2)** Development of the concepts in chemistry. Biographies of eminent chemists. *Prerequisite:* 30 credits in chemistry.
- 15.620 Chemistry of the Carbohydrates (3)** Configurational isomerism, ring structure, and tautomeric forms. Chemistry of the uronic acids, anhydro sugars, glycosides, hexitols, cyclitols, disaccharides, and representative polysaccharides. *Prerequisites:* 15.401 and 15.520.
- 15.626 Heterocyclic Compounds (3)** Chemistry of pyridine, pyrrole, quinoline, other heterocyclic compounds. *Prerequisite:* 15.520.
- 15.628 Quantitative Organic Analysis (3)** Pregl methods. Use of microbalance; determinations of carbon, hydrogen, nitrogen and halogen by combustion; determination of molecular weight (Rast), alkoxyl, hydroxyl and other functional groups. One hour lecture, six hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 15.320, 15.350, and permission of instructor.
- 15.630 Physical Organic Chemistry (3)** Polar and free radical mechanism, kinetics and stereochemistry of organic reactions. Physical techniques for obtaining information on organic reactions. *Prerequisites:* 15.400 and 15.520.
- 15.632 High Polymer Chemistry (3)** The concepts of macromolecules and their non-homogeneous nature. The physical-organic chemistry of polymerization. Behavior and structure of polymers. Demonstrations of special laboratory techniques. *Prerequisites:* 15.320 and 15.401.
- 15.640 Colloid and Surface Chemistry (3)** Application of physicochemical principles of colloidal systems. Solid and liquid surfaces, sorption, large molecules in solution, structure of natural and synthetic colloids. *Prerequisite:* 15.401.

- 15.662 Chemistry of Organic Drugs (3)** The preparation and synthetic analogues of therapeutically active substances. Salicylates, purine and pyrimidine derivatives, alkaloids, sex hormones, cardioactive glycosides and antibiotics. *Prerequisite:* 15.561.
- 15.663 Enzyme Chemistry (3)** Classification, kinetics, chemical properties, and mechanism of action; role in metabolic processes. *Prerequisite:* 15.561.
- 15.666 Proteins and Amino Acids (3)** Detailed treatment of the chemistry and metabolism of amino acids, polypeptides, purines, pyrimidines, and proteins. *Prerequisite:* 15.561.
- 15.667 Chemistry of some Biologically Active Compounds (3)** Development of knowledge of the chemistry of some biologically active compounds. Detailed study of representative and important examples from the different classes of biologically active compounds. *Prerequisite:* 15.561.
- 15.700 Seminar in Chemistry (1)** Selected topics. Preparation and presentation of a paper of professional quality. *Prerequisite:* permission of Department.
- 15.797 Master's Thesis Seminar (3-6).**



EARTH SCIENCES

Professors: JOHN W. FREY (Emeritus); MATTHEW F. NORTON (Chairman). *Assistant Professor:* MORRIS S. PETERSEN. *Adjunct Professor:* GEORGE S. SWITZER. *Professorial Lecturers:* PAUL S. BAUER; IRVING BREGER. *Lecturer:* ISIDORE ZIETZ.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Science

University Requirements 38-43 hours

Students majoring in earth sciences are required to complete either 51.210 and 51.211 Elements of General Physics I and II (8), or 51.220 and 51.221 Fundamentals of General Physics I and II (10), depending on their area of interest in Earth Sciences, as part of their University requirements.

Language Requirement 12 hours

Students majoring in earth sciences are required to take French, German, or Russian to satisfy the language requirement. Students who already have an intermediate-level knowledge of one of these foreign languages upon entering the University are strongly urged to study a second appropriate language.

Departmental Requirements:

Major courses 40 hours

All students are required to complete the following courses (core requirements in Earth Sciences) with grades of C or better: 27.101 and 27.102 Principles of Earth Sciences I and II (8), 27.321 and 27.322 Biological Earth Sciences I and II (8), 27.331 and 27.332 Chemical Earth Sciences I and II (8), 27.341 and 27.342 Physical Earth Sciences I and II (8), 27.401 Senior Seminar in Earth Sciences (3), 27.472 Field Methods (4), and 27.500 Literature of Earth Sciences (1).

All students whose cumulative academic index allows it (1.75 or better) are strongly urged to undertake an Individual Research Project 27.490 for three hours credit in the senior year.

Related courses 8-12 hours

15.110 and 15.111 General Chemistry I and II (8) or 15.200 Chemical Principles (4); and 9.110 General Zoology (4). Other additional related courses may be advisable for certain areas of interest within Earth Sciences.

Tool courses 8-14 hours

Mathematics through 41.223 Differential and Integral Calculus II. Usual sequence: 41.110-41.111 Fundamentals of Mathematics I and II (6), 41.222-41.223 Differential and Integral Calculus I and II (8).

Electives to complete 126 hours

Graduate Degree—Master of Science

Course Requirement: Minimum of 30 hours of approved graduate work, including 27.797 Master's Thesis Seminar (3-6).

Written Comprehensive Examinations: Two, including 27.1 General Earth Sciences, and one specialized field.

Other Requirements: Reading proficiency in French, German, or Russian as evidenced (1) by satisfactory completion of an intermediate level course, or (2) by a proficiency examination. Thesis and oral defense of thesis.

Other Graduate Degrees

See page 82 for information concerning requirements for the Master of Science in Science Teaching.

Graduate Comprehensive Examination Fields

Core Field. 27.1 General Earth Sciences.

Specialized Fields. 27.2 Earth Sciences: Biological, 27.3 Earth Sciences: Chemical, 27.4 Earth Sciences: Physical.

UNDERGRADUATE COURSES

- 27.100 Earth Sciences (3)** Survey of earth features and processes: time, weather, climate, the oceans, minerals, rocks, landforms, glaciers, volcanoes, earthquakes, origin and development of life, geologic history, resources.
- 27.101 Principles of Earth Sciences I (4)** Lecture identical with 27.100; laboratory: geographic grid, construction and interpretation of planimetric, topographic, and geologic maps, weather analysis, navigation, identification of minerals, rocks, and fossils. Three hours lecture, four hours laboratory, field trip. Laboratory fee, part-time students, \$10.
- 27.102 Principles of Earth Sciences II (4)** Geologic history of North America: sedimentation, stratigraphy, and structural geology; map and aerial photograph interpretation; chemical and microscopic identification of minerals and rocks; field mapping. Two hours lecture, four hours laboratory, two field trips. Laboratory fee, part-time students, \$10. *Prerequisite:* 27.101 or 27.100 and 27.103, or 27.150.
- 27.103 Principles of Earth Sciences I Laboratory only (1)** Those who have taken 27.100 may register for this laboratory in order to complete the equivalent of 27.101 and qualify to enter 27.102.
- 27.150 Basic Geography (4)** Fundamental principles of physical geography: earth origin, position, and motion; maps; weather; climate; landforms; oceans; resources—their use and conservation; natural limits on development. Three hours lecture, two hours laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* permission, except for students in the School of International Service.
- 27.321 Biological Earth Sciences I (4)** Principles of classification of living and fossil organisms compared; biostratigraphy and evolution; origin and occurrence of fossils. Illustrated by select vertebrate and invertebrate taxonomic groups. Two hours lecture, four hours laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 27.102 or permission.
- 27.322 Biological Earth Sciences II (4)** A study of the evolution of the invertebrate phyla as represented by fossils. Two hours lecture, four hours laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 27.321.
- 27.331 Chemical Earth Sciences I (4)** Geochemical concepts and procedures; chemical and crystallographic classification and identification of minerals;

principles of igneous rock classification; the petrographic microscope and x-rays in mineral identification. Two hours lecture, four hours laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 27.102 and 15.111 or 15.200.

- 27.332 Chemical Earth Sciences II (4)** Chemistry of silicate melts, sedimentation, and metamorphism; hand specimen and microscopic identification of igneous, sedimentary, and metamorphic rocks and ores; isotope geochronology; geothermometry; mineral deposits. Two hours lecture, four hours laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 27.331.
- 27.341 Physical Earth Sciences I (4)** Interpretation of gravity, heat flow, electric, magnetic, and seismic data; wave motion in earth processes; atmospheric physics; physics of sedimentation and geomorphology; experimental rock deformation. Two hours lecture, four hours laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 27.102 and 51.211 or 51.221.
- 27.342 Physical Earth Sciences II (4)** Identification, classification, analysis in orthographic and stereographic projections, and significance of earth structures; structural petrology; map interpretation and block diagrams. Two hours lecture, four hours laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 27.341.
- 27.401 Senior Undergraduate Seminar (3)** Required of all senior majors in the Department of Earth Sciences. Consideration of selected cross-disciplinary problems in earth sciences. *Prerequisite:* permission.
- 27.472 Field Methods (4)** Field problems in earth sciences; map construction and mechanics of mapping; two field studies with formal reports and maps. Average of eight hours per week in the field. *Prerequisites or Corequisites:* 27.322, 27.332, and 27.342.

ADVANCED COURSES

(500-level courses are open to graduate students and qualified advanced undergraduates with permission; 600- and 700-level courses are open only to graduate students.)

- 27.500 Literature of Earth Sciences (1)** Survey of reference, journal, and source literature; styles of scientific report writing and scientific illustration.
- 27.501 Analytical Geology (3)** Study of the origin, materials, and processes of the lithosphere, atmosphere, hydrosphere, and biosphere, with emphasis on identification and analysis of geologic materials and forms. Two hours lecture, two hours laboratory. Laboratory fee, all students, \$5. (*Designed primarily for teachers enrolled under the provisions of an in-service program sponsored by the National Science Foundation.*) *Prerequisite:* permission of the In-Service Institute Director or of the Department.
- 27.502 Earth Sciences Materials (3)** Minerals, rocks, and fossils examined by petrographic and binocular microscopes, blowpipe, wet chemical tests. Two hours lecture, two hours laboratory. Laboratory fee, all students, \$5. (*Designed primarily for teachers enrolled under the provisions of an in-service program sponsored by the National Science Foundation.*) *Prerequisite:* permission of the In-Service Institute Director or of the Department.

- 27.506 Oceanography (3)** Survey of the physics, chemistry and biology of the oceans; physiography and geology of ocean basins. *Prerequisite:* permission.
- 27.560 Regional Geography (3)** Location, physical subdivisions, climatic factors, physical control of boundaries, transportation, and other geographic features of a selected major area. May be repeated for credit, if a different area is the topic. *Prerequisite:* 27.100, 27.101 or 27.150.
- 27.600 Advanced Topics in Earth Sciences (3)** Study of a selected special topic or topics in Earth Sciences. May be repeated for credit, if a different topic is covered. *Prerequisite:* permission.
- 27.621 Advanced Biological Earth Sciences I (4)** The effects of environment on the morphology and distribution of living and fossil organisms.* *Prerequisite:* permission.
- 27.622 Advanced Biological Earth Sciences II (4)** The theory and practical use of fossils in stratigraphy.* *Prerequisite:* 27.621.
- 27.631 Advanced Chemical Earth Sciences I (4)** Crystal growth and the external and internal symmetry of crystals as revealed by goniometric, optical, and x-ray analyses; crystal chemistry; geometric crystallography.* *Prerequisite:* permission.
- 27.632 Advanced Chemical Earth Sciences II (4)** Principles of chemical equilibrium applied to igneous and metamorphic rocks; origin, evolution, and crystallization of magmas; environment and facies of metamorphism; microscopic analysis of rocks.* *Prerequisite:* 27.631.
- 27.641 Advanced Physical Earth Sciences I (4)** Physical bases of gravity, heat flow, electric, magnetic, and seismic phenomena and measurements. Observations and case studies.* *Prerequisite:* permission.
- 27.642 Advanced Physical Earth Sciences II (4)** Physical bases of dynamic meteorology and oceanography; theory of atmospheric and oceanic tropospheric and stratospheric circulation; waves and tides.* *Prerequisite:* 27.641 or permission.
- 27.700 Seminar in Earth Sciences (3)** Selected topics in earth sciences; preparation and presentation of a technical paper of professional quality. May be repeated for credit, if different topics are covered. *Prerequisite:* permission.
- 27.797 Master's Thesis Seminar (3-6).**

* Two hours lecture, four hours laboratory. Laboratory fee, part-time students, \$10.

PHYSICS

Professors: MARK HARRISON (Chairman); BANCROFT W. SITTERLY. *Professor in Research:* ROSS GUNN. *Associate Professor in Research:* RICHARD V. WATERHOUSE. *Assistant Professors:* CHARLES M. DAVIS, JR.; JACEK JARZYNSKI; ALAN D. MORRIS. *Adjunct Professors:* EARL R. CALLEN; RANDALL S. CASWELL; PAUL Z. KALAVSKI. *Professorial Lecturers:* FERNAND D. BEDARD; SAMUEL J. MOSS; DAVID SALTUS.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Science

University Requirements 38-43 hours

Students majoring in physics are advised to complete 15.110 and 15.111 General Chemistry I and II (8) in their freshman year as part of their University requirements.

Language Requirement 12 hours

Departmental Requirements:

Students majoring in physics should register for 51.220-221 Fundamentals of General Physics I and II at the earliest opportunity. In order to satisfy the prerequisites for this course, students must complete 41.110 and 41.111 Fundamentals of Mathematics I and II and 41.222 and 41.223 Differential and Integral Calculus I and II during their first and second years.

The normal prerequisites of courses at the 300-level and above are 51.220 and 51.221 Fundamentals of General Physics I and II. However, with superior performance, 51.210 and 51.211 Elements of General Physics I and II may be substituted for 51.220 and 51.221 provided departmental approval is obtained.

Major courses 40 hours

(a) 51.220 and 51.221 Fundamentals of General Physics I and II (10).

(b) 51.330 and 51.331 Principles of Mechanics I and II (6), 51.370 Introduction to Modern Physics (3), 51.450 and 51.451 Electricity and Magnetism I and II (6), and 51.570 Introduction to Quantum Mechanics (3).

(c) Four hours to be selected from 51.371 Modern Physics Laboratory (1), 51.410 Special Topics Laboratory (1), 51.412 Machine Shop Technique (1), 51.452 and 51.453 Electrical Laboratory I and II (2), 51.490 Undergraduate Research (3), 51.543 Optics Laboratory (1), 51.556 Electronics Laboratory I (1), 51.575 Nuclear Physics Laboratory (1).

(d) Eight additional hours of 300-level courses and above, excluding 51.500-501 which may be counted as a tool course only.

Related courses 8-11 hours

15.110 and 15.111 General Chemistry I and II (8). Three additional hours selected from 47.521 Philosophy of Science (3), or 81.506-507 History of Scientific Thought I and II (3-3) are recommended.

Tool courses	17-23 hours
41.110 and 41.111 Fundamentals of Mathematics I and II (6), 41.222 and 41.223 Differential and Integral Calculus I and II (8), and 41.321 Differential Equations (3). Students planning to continue on to graduate work in physics should take 51.500 and 51.501 Introduction to Mathematical Physics I and II (6).	
Electives	to complete 126 hours

Graduate Degree—Master of Science

Course Requirements: Minimum of 30 hours of approved graduate work in Physics which must include

- (a) 51.570 Introduction to Quantum Mechanics (3) if not included in the undergraduate program.
- (b) Nine hours on the 600-level.
- (c) 51.797 Master’s Thesis Seminar (3-6).

Written Comprehensive Examinations: Two; one over the subject matter of mechanics and modern physics and one from the areas of electromagnetics, optics, and thermal physics.

Other Requirements: Thesis and oral defense of thesis.

Graduate Comprehensive Examination Fields

Core Fields. 51.1 Mechanics and Modern Physics, 51.2 Electromagnetism, Optics, and Thermodynamics.

UNDERGRADUATE COURSES

- 51.100 The Science of Physics (3)** Concept of energy and related concepts of physics in fields of mechanics, heat, electricity, radiant energy, nuclear energy. Demonstrations; no laboratory.
- 51.210 Elements of General Physics I (4)** Mechanics, heat, and sound. Three hours of lecture, two hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 41.111.
- 51.211 Elements of General Physics II (4)** Electricity and magnetism, light, modern physics. Three hours of lecture, two hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 51.210.
- 51.220 Fundamentals of General Physics I (5)** An intensive treatment of mechanics, heat, and sound for students of the physical and mathematical sciences. Three hours of lecture, two hours of recitation, and two hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 41.222 or concurrent registration.
- 51.221 Fundamentals of General Physics II (5)** An intensive treatment of electrostatics, electromagnetism, optics, and a survey of modern physics for students of the physical and mathematical sciences. Three hours of lecture, two hours of recitation, and two hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 51.220; 41.223 or concurrent registration.
- 51.330 Principles of Mechanics I (3)** Dynamics and kinematics of particles and systems of particles. Oscillating systems. Central forces and gravitation. Relativistic mechanics. *Prerequisite:* 51.221.

- 51.331 Principles of Mechanics II (3)** Moving coordinate systems, kinematics and dynamics of rigid bodies. Mechanics of continuous media, wave propagation, fluid flow and elasticity. Lagrange's and Hamilton's equations. *Prerequisites:* 51.330; 41.321 or concurrent registration.
- 51.370 Introduction to Modern Physics (3)** The experimental evidence leading to present conceptions of matter. Elementary particles, optical and X-ray spectra, atomic, molecular, and nuclear structure, the Bohr theory and elementary quantum theory. *Prerequisite:* 51.330.
- 51.371 Modern Physics Laboratory (1)** Millikan's oil drop, measurement of e/m , radioactive decay measurements, nuclear scattering, thermionic emission, Bragg diffraction, beta ray spectrometer, mass spectrometer, vacuum systems. Three hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 51.370 or concurrent registration.
- 51.410 Special Topics Laboratory (1)** Selected experiments to accompany intermediate courses in mechanics, heat, acoustics, optics, and modern physics. Individual assignments. Three hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* permission.
- 51.412 Machine Shop Technique (1)** Basic skills and procedures in shop work. Open to advanced undergraduates. Two hours of shop work. *Prerequisite:* permission.
- 51.450 Electricity and Magnetism I (3)** Electric charges, forces, fields and dielectrics. Direct current circuits. Electromagnetic and magnetic phenomena. *Prerequisites:* 51.221; 51.330 or concurrent registration.
- 51.451 Electricity and Magnetism II (3)** Electromagnetism, alternating current circuits, Maxwell's equation and electromagnetic waves. *Prerequisites:* 51.450; 41.321 or concurrent registration.
- 51.452 Electrical Laboratory I (1)** Basic techniques of electrical and magnetic measurements. Electrostatic measurements. Meter calibration, resistance measurements, bridges, galvanometric technique. Absolute measurements, Magnetic effects. Magnetometer measurements. Hall effect. Three hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 51.450 or concurrent registration.
- 51.453 Electrical Laboratory II (1)** Measurement techniques. A-C circuits. Electronic instruments and techniques. Thermionic emission. A-C bridges. Rectifiers, power supplies, waveforms, frequency measurements, amplifiers. Thermocouples and thermoelectric measurements. Three hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisite:* 51.451 or concurrent registration.

Special Courses for Teachers

- 51.320 Physics Concepts for Teachers I (3)** Physics as a conceptual system. Factual, historical, and philosophical basis of key concepts. Concepts of mechanics: inertia, force, momentum, energy. Formulations of mechanical theory—mathematical structure. Thermodynamic concepts. Kinetic theory as bridge between mechanics and heat. *Prerequisites:* a course in general physics and a year of college mathematics.

- 51.321 Physics Concepts for Teachers II (3)** Continuation of 51.320. Concepts of electricity and magnetism: charge, field, potential. Electromagnetic interaction. Concepts of radiation; properties of waves; radiative energy transmission. Quantum concepts: basis and implications. Modern viewpoint in physics. *Prerequisite:* 51.320.
- 51.322 Experimental Physics for Teachers I (3)** Place of experimentation in physics. Measurable quantities, measuring instruments, techniques of measurement. Experimental studies in particle, rigid body, and fluid mechanics. Experimental study of heat. *Prerequisites:* a course in general physics and a year of college mathematics.
- 51.323 Experimental Physics for Teachers II (3)** Continuation of 51.322. Measurable electric and magnetic quantities; measuring instruments; techniques of circuitry. Experimental studies in electricity and magnetism, light, modern physics. *Prerequisite:* 51.322.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

- 51.500 Introduction to Mathematical Physics I (3)** The following mathematical topics will be presented and related to various areas of physics: Scalar and vector fields, matrices and tensors. Fourier series, Fourier and Laplace transforms, one-dimensional wave equation, variational methods. *Prerequisites:* 51.331, 51.451, 41.321.
- 51.501 Introduction to Mathematical Physics II (3)** The following mathematical topics will be presented and related to various areas of physics: Solutions to the Laplace and the wave equation in various coordinate systems, special functions, eigenfunctions and eigenvalues. Sturm-Liouville theory, complex variables, contour integration, probability theory. *Prerequisite:* 51.500.
- 51.531 Acoustics (3)** Vibrating systems, wave propagation in strings, membranes and fluids. Radiation, diffraction and scattering. Transducers, ultrasonics, architectural acoustics, and underwater sound. *Prerequisites:* 51.331 and 41.321.
- 51.533 Physical Astronomy (3)** Introduction to the physics of the celestial bodies, solar and stellar systems, interplanetary and interstellar space. General survey. Selected gravitational problems. Selected problems of radiation. *Prerequisites:* 51.331, 51.370, and 41.321.
- 51.541 Optics (3)** Geometric optics, reflection, refraction at plane and spherical surfaces, achromatism, plane and elliptically polarized light. Diffraction, single and multiple slits, interferometers, absorption, scattering, and dispersion. Atomic spectra. *Prerequisites:* 51.370 and 51.451.
- 51.543 Optics Laboratory (1)** Ray optics. Velocity of light. Lloyd's mirror. Prism spectrometer. Diffraction phenomena. Polarization. Michelson, Fabry-Perot, and stellar interferometers. Microwaves. Faraday effect. Zeeman effect. Three hours of laboratory. Laboratory fee, part-time students. \$10. *Prerequisite:* 51.541 or concurrent registration.
- 51.554 Principles of Electronics (3)** Fundamental principles of vacuum tubes, semi-conductors and transistors, with applications to amplifiers, oscillators, and power supplies. *Prerequisites:* 51.370 and 51.451.

- 51.556 Electronics Laboratory I (1)** Laboratory techniques and skills in the use of vacuum tubes, transistors, photoelectric devices and gas tubes. Design, construction, and analysis of amplifiers, oscillators, and power supplies. Three hours of laboratory. Laboratory fee, part-time students, \$10. *Prerequisites:* 51.453; 51.554 or concurrent registration.
- 51.560 Thermodynamics and Statistical Physics (3)** Heat, temperature, and the properties of matter. The first and second law of thermodynamics, cycles, reversibility, entropy changes, and the thermodynamic potentials. Statistical definition of entropy. Kinetic theory and the statistical interpretation of thermodynamics. Maxwell-Boltzman, Bose-Einstein, and Fermi-Dirac statistics. *Prerequisites:* 51.330, 51.370 and 51.450.
- 51.570 Introduction to Quantum Mechanics (3)** The experimental basis of quantum theory, the Schroedinger quantum mechanics. Applications of quantum mechanics to the hydrogen atom, potential well. The exclusion principle, spin and angular momentum, the multielectron atom. Quantum statistics. *Prerequisites:* 51.331, 51.370, 51.451, and 41.321.
- 51.573 Nuclear Physics (3)** Nuclear properties; radioactivity; interactions and detection of nuclear radiations; neutrons and fission; nuclear forces, models; mesons. *Prerequisite:* 51.570.
- 51.575 Nuclear Physics Laboratory (1)** Experiments in alpha scattering, gamma-ray spectroscopy, positron annihilation, beta-ray spectra, neutron penetration, etc. *Prerequisite:* 51.573 or concurrent registration.
- 51.579 Solid State Physics (3)** Structure of crystals, lattice vibrations and thermal properties; dielectrics; band theory of solids, conductors, semiconductors, and transistors; magnetism; dislocations. *Prerequisites:* 51.560 and 51.570.
- 51.599 Physics Seminar (1)** Group study and discussion of selected areas in physics. Topics to be announced. May be repeated for credit. *Prerequisite:* permission of instructor.
- 51.630 Theoretical Mechanics I (3)** Theoretical treatment of the general principles of mechanics. The conservation theorems, Lagrange's equations and generalized coordinates, Hamilton's principle, tensor and matrix analysis and rigid body dynamics. *Prerequisites:* 51.331; 51.500 or concurrent registration.
- 51.631 Theoretical Mechanics II (3)** Special theory of relativity, Hamilton equations, Canonical transformations, Hamilton-Jacobi theory, small oscillation theory, Lagrangian and Hamiltonian densities, kinematics of deformable media, elasticity and fluid mechanics. *Prerequisite:* 51.630.
- 51.634 Waves and Vibrations I (3)** General theory of waves and vibrations. Fourier series and transforms, orthogonal functions and boundary value problems illustrated by examples of waves in fluids, membranes and strings. Perturbation methods. *Prerequisites:* 51.501 and 51.531.
- 51.635 Waves and Vibrations II (3)** The scalar wave equation in various coordinate systems and the characteristic functions, Green's functions, the general theory of radiation and scattering, elastic waves. *Prerequisite:* 51.634.
- 51.650 Electromagnetic Theory I (3)** The electrostatic field, dielectrics, potential theory, electromagnetism, magnetic materials, Maxwell's equations. *Prerequisites:* 51.451; 51.500 or concurrent registration.

- 51.651 Electromagnetic Theory II (3)** The wave equation and boundary value problems, diffraction, wave guides, radiation and scattering, relativity and the relativistic formulation of electrodynamics, selected topics in advanced electrodynamics. *Prerequisite:* 51.650.
- 51.670 Quantum Mechanics I (3)** The experimental background to quantum mechanics, the Schrodinger equation, eigenfunctions and eigenvalues, the harmonic oscillator, the square well, the hydrogen atom, scattering. *Prerequisites:* 51.501, 51.570; 51.630 and 51.650 or concurrent registration.
- 51.671 Quantum Mechanics II (3)** The matrix formulation of quantum mechanics, approximate methods, angular momentum and spin, radiation, applications to atoms, molecules, and solid state. *Prerequisite:* 51.670.
- 51.675 Statistical Physics (3)** Elements of probability and random functions. Kinetic theory, the statistical interpretation of thermodynamics. MB, BE, and FD statistics. Random processes, noise, fluctuations, and irreversible phenomena. *Prerequisites:* 51.560 and 51.570.
- 51.797 Master's Thesis Seminar (3-6).**



MATHEMATICS AND STATISTICS

Professors: GRACE SHOVER QUINN; STEVEN H. SCHOT (Chairman); WALTER F. SHENTON (Emeritus); JOHN H. SMITH. *Associate Professor:* DAVID J. KING. *Assistant Professors:* DOUGLAS L. GUY; IRVING J. KATZ; BASIL P. KORIN; STIRLING P. SMITH. *Instructors:* RUSSELL V. PERSON; HOWARD WILSON. *Adjunct Professors:* ERNEST E. BLANCHE; HOWARD H. CAMPAIGNE; JEROME CORNFIELD; PHILIP DESIND; CHARLES H. FRICK; WALTER W. JACOBS; ELGY S. JOHNSON; RUSSELL C. PHELPS; ERNEST RUBIN; RAYMOND J. SEEGER; WALT R. SIMMONS; FEODOR THEILHEIMER; HENRY P. THIELMAN. *Professorial Lecturers:* GEORGE F. CRAMER; ELIZABETH CUTHILL; ARLINE S. KATZ; CLAIRE T. MACHLIN; MILTON MOSS; ROSS L. PACKARD; HARRY M. ROSENBLATT; WILSON L. SCOTT; DANIEL SHANKS; JOSEPH WEGSTEIN. *Lecturers:* MORRIS ABRAMS; BARNETT R. AGINS; IRVING GEDANKEN; JOHN W. GRACZA; ARTHUR JAFFE.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements38-43 hours

Students majoring in statistics are required to take 51.210-211 Elements of General Physics I and II (8) or 51.220-221 Fundamentals of General Physics I and II (10) as part of their University requirements.

Language Requirement (French, German, or Russian) 12 hours

Departmental Requirements:

Bachelor of Arts (Major in Mathematics)

Major courses 29 hours

41.110, 41.111, 41.222, 41.223, 41.310, 41.311; three hours selected from 41.321, 41.440, 41.474; and one year selected from 41.502-503, 41.512-513, 41.520-521, 41.550-551, 69.500-501.

Related courses22-25 hours

51.220-221 Fundamentals of General Physics I and II (10); 51.330-331 Principles of Mechanics I and II (6) or other course in physics with laboratory beyond 51.330-331; eight hours in another natural science or 9 hours in probability and statistics with calculus prerequisite.

Bachelor of Arts (Major in Statistics)

Major courses 24 hours

69.202 Basic Statistics (3); 41.474 Probability (3); 69.502 Regression Analysis (3); 69.507-508 Statistical Methodology I and II (6); 69.572 Design of Experiments (3); and 69.500-501 Mathematical Statistics I and II (6).

Related courses 17 hours

41.110-111 Fundamentals of Mathematics I and II (6); 41.222-223 Differential and Integral Calculus I and II (8); 41.310 Higher Algebra I (3).

Electivesto complete 126 hours

Graduate Degrees—Master of Arts; Doctor of Philosophy

MASTER OF ARTS IN MATHEMATICS

Course Requirements: Minimum of 30 hours of approved graduate work, including 41.797 Master's Thesis Seminar in Mathematics and Statistics (3-6).

Written Comprehensive Examinations: Three, including 41.1 Modern Algebra or 41.2 Matrix Theory; 41.3 Real Variables or 41.4 Complex Variables; and one other approved field.

Other Requirements: Six semester hours of French, German or Russian, or proficiency examination. Thesis and oral defense of thesis.

MASTER OF ARTS IN STATISTICS

Course Requirements: Minimum of 30 hours of approved graduate work, including 41.797 Master's Thesis Seminar in Mathematics and Statistics (3-6).

Written Comprehensive Examinations: Three, including 69.1 Statistical Theory; 41.24 Theory of Probability; and one other approved field in statistics, mathematics (especially 41.2 Matrix Theory or 69.26 Analysis for Statistics) or field of application.

Other Requirements: Six semester hours of Russian, German, or French, or proficiency examination. Thesis and oral defense of thesis.

DOCTOR OF PHILOSOPHY IN MATHEMATICS

Course Requirements: Minimum of 72 hours of approved graduate work, at least 36 (including dissertation credit) of which must be completed in residence at The American University, and six of which must be in 41.799 Doctoral Dissertation Seminar in Mathematics and Statistics (3-6).

Written Comprehensive Examinations: Five approved fields. 41.6 Modern Algebra and Matrix Theory; 41.5 Real and Complex Variables; and three other approved fields, at least two of which must be in mathematics or mathematical statistics and one of which may be in a field closely related to field of major interest.

Other Requirements: Proficiency in two languages chosen from Russian, German, or French. Dissertation on a topic sponsored by a full-time faculty member in an appropriate field on analysis or algebra and oral defense of dissertation.

DOCTOR OF PHILOSOPHY IN STATISTICS

Course Requirements: Minimum of 72 hours of approved graduate work, at least 36 (including dissertation credit) of which must be completed in residence at The American University, and six of which must be in 41.799 Doctoral Dissertation Seminar in Mathematics and Statistics (3-6).

Written Comprehensive Examinations: Five approved fields as follows: 69.2 and 69.3 Advanced Statistical Theory I and II; 41.24 Theory of Probability; 69.26 Analysis for Statistics; and 41.27 Linear Algebra for Statistics.

Other Requirements: Proficiency in two languages chosen from Russian, German and French. Dissertation on a topic sponsored by a full-time faculty member in an appropriate field of mathematical statistics and oral defense of dissertation.

Graduate Comprehensive Examination Fields

MATHEMATICS

Core Fields. 41.1 Modern Algebra (M.A. only), 41.2 Matrix Theory (M.A. only), 41.3 Real Variables (M.A. only), 41.4 Complex Variables (M.A. only), 41.5 Real and Complex Variables (Ph.D. only), 41.6 Modern Algebra and Matrix Theory (Ph.D. only).

Specialized Fields. 41.10 Mathematical Foundations, 41.11 Number Theory, 41.12 Differential Equations, 41.13 Integral Equations, 41.14 Calculus of Variations, 41.19 Finite Differences and Difference Equations, 41.20 Numerical Solution of Differential Equations, 41.21 Matrix Computation, 41.22 Numerical Analysis—Machine Methods, 41.23 Stochastic Processes, 41.24 Theory of Probability, 41.25 Linear and Dynamic Programming.

STATISTICS

Core Fields. 69.1 Statistical Theory (M.A. only), 69.2 Advanced Statistical Theory I (Ph.D. only), 69.3 Advanced Statistical Theory II (Ph.D. only), 41.24 Theory of Probability (M.A. and Ph.D.), 69.26 Analysis for Statistics, 41.27 Linear Algebra for Statistics (Ph.D. only).

Specialized Fields. 69.10 Theory of Experiment Design, 69.12 Quality Control and Sequential Analysis, 69.13 Business Statistics, 69.14 Labor Statistics, 69.20 Theory of Sampling.

UNDERGRADUATE COURSES

MATHEMATICS

- 41.010 Elementary Algebra (0)** Arithmetical operations; measurement; percentage; fundamental algebraic operations; linear and quadratic equations; ratio, proportion and variation; simple statistics. A non-credit course for selected entering students. Tuition, part-time students, regular three-credit hour fee.
- 41.100 Survey of Mathematics I (3)** Radicals and exponents; functions and graphs; linear and quadratic equations, systems of equations; ratio, proportion, and variation; progressions; binomial theorem; logarithms. *Prerequisite:* 41.010 or two years high school mathematics. Not open to students with credit for 41.110 or 41.160.
- 41.101 Survey of Mathematics II (3)** Trigonometry: functions of angles and numbers, identities and equations; inequalities; complex numbers; elementary theory of equations; permutations and combinations; set terminology; systems of linear equations. *Prerequisite:* 41.100. Not open to students with credit for 41.111.
- 41.110 Fundamentals of Mathematics I (3)** Mathematical logic; number systems; polynomials; algebraic fractions; exponents and radicals; sets; equations; inequalities; matrices and determinants; functions and relations; algebraic functions. *Prerequisite:* Three years high school mathematics with "B" average.
- 41.111 Fundamentals of Mathematics II (3)** Exponential and logarithmic functions; trigonometric functions; inverse trigonometric functions; De Moivre's theorem; analytic geometry: Cartesian and polar coordinates, conic sections, applications, parametric equations. *Prerequisite:* 41.101 or 41.110.

- 41.160 Basic Mathematics (3)** Required for business majors. Number systems; fundamental algebraic operations; linear and simultaneous linear equations; determinants; quadratic equations; inequalities; exponents and radicals; logarithms; applications to business and economics. *Prerequisite:* 41.010 or two years high school mathematics. Not open to students with credit for 41.100 or 41.110.
- 41.222 Differential and Integral Calculus I (4)** Differentiation of algebraic and transcendental functions with applications to geometry and physics, maxima and minima, mean value theorems; integration of polynomials with applications to area, volume, arc length, and physics. *Prerequisite:* 41.111.
- 41.223 Differential and Integral Calculus II (4)** Methods of integration, hyperbolic functions, vectors and parametric equations, partial differentiation, multiple integration, indeterminate forms, infinite series, Taylor's theorem. *Prerequisite:* 41.222.
- 41.310 Higher Algebra I (3)** Vector spaces, systems of linear equations, solutions by matrices, determinants, linear transformations, algebraic forms. *Prerequisite:* 41.222 with grade of "C" or better.
- 41.311 Higher Algebra II (3)** Sets; groups, rings, integral domains; fields-rational numbers, real numbers, complex numbers, polynomial rings. *Prerequisite:* 41.310.
- 41.321 Differential Equations (3)** First-order first-degree equations, linear equations of n'th order with constant coefficients, Laplace transforms, applications to mechanics and electrical circuits, special equations of higher order, solution in series. *Prerequisite:* 41.223.
- 41.440 Modern Geometry (3)** Applications of linear algebra to analytic geometry; linear mappings, Euclidean and unitary vector spaces; geometry of quadric surfaces; reduction of quadratic forms. *Prerequisite:* 41.311.
- 41.474 Probability (3)** Algebra of sets; probability in discrete sample spaces; combinatorial analysis; random variables; binomial, Poisson, normal and other distributions; applications. *Prerequisite:* 41.223.

STATISTICS

- 69.202 Basic Statistics (3)** Classification of data, averages, dispersion, probability, frequency distributions, confidence intervals, tests of significance, simple regression and correlation. *Prerequisite:* 41.100 or 41.160, or equivalent.
- 69.300 Business Statistics (3)** Estimation, inference, multiple regression and correlation, index numbers, secular trend, seasonal and cyclical variation. *Prerequisite:* 69.202. Not open to students with credit for 69.301.
- 69.301 Psychological Statistics (3)** Estimation, inference, special methods of two-variable correlation, multiple regression and correlation, design of samples and experiments, contingency tables. *Prerequisite:* 69.202. Not open to students with credit for 69.300.
- 69.400 Managerial Statistics (3)** Survey of first-year statistics (see 69.202 and 69.300); required for M.B.A. candidates entering without 6 hours of statistics. *Prerequisite:* 41.100 or 41.160, or graduate status.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

MATHEMATICS

FOUNDATIONS AND ALGEBRA

- 41.502 Foundations of Mathematics I (3)** Modern developments in mathematics including elementary symbolic logic, truth tables, axiomatics, foundations of geometry, introduction to set theory, transfinite numbers. *Prerequisites:* 41.223 and further work or teaching experience in mathematics.
- 41.503 Foundations of Mathematics II (3)** Continuation of 41.502. Peano's axioms, Dedekind cuts, the real and complex number systems, functions, homeomorphism and topological concepts, groups, rings, fields and other algebraic systems. *Prerequisite:* 41.502 or equivalent.
- 41.510 Matrix Theory (3)** Vector spaces, linear transformations, similarity, rational and classical canonical forms, unitary spaces, unitary equivalence, quadratic forms, congruence, rings of matrices, matrix representations of groups and algebras. *Prerequisite:* 41.310.
- 41.512 Modern Algebra I (3)** Mappings, cardinality, partitions; group theory—complexes, various mappings; rings, hypercomplex systems, ideals; polynomial—interpolation formulas, factorization, resultant; field extensions. *Prerequisite:* 41.311.
- 41.513 Modern Algebra II (3)** Group theory—operator homomorphism, normal and composition series, direct products; Galois theory; infinite field extensions; real fields. *Prerequisite:* 41.512.
- 41.515 Number Theory (3)** Divisibility, prime numbers, number-theoretic functions, residue classes and congruence of numbers, quadratic residues, diophantine equations, quadratic forms. *Prerequisites:* 41.223 and additional work or experience in mathematics.
- 41.518 Linear Programming (3)** Theoretical, computational, and applied aspects of linear programming. Simplex, revised simplex, transportation algorithms; duality; parametric programming; theory of games and management problems applications. *Prerequisite:* 41.310.
- 41.519 Nonlinear and Dynamic Programming (3)** Simplex, gradient, projection, multiplex, and feasible-direction methods for convex programming; deterministic and stochastic multidimensional decision processes; policy-space technique; applications in many fields; computer implementation. *Prerequisites:* 41.510, 41.518 and 41.520.
- 41.616 Theory of Finite Groups (3)** The group concept: isomorphism, automorphism, and homomorphism, quotient groups; subgroups; cyclic groups; permutations, transitivity, and primitive groups; Sylow's theorem; Abelian groups. *Prerequisite:* 41.513.

ANALYSIS, GEOMETRY, AND TOPOLOGY

- 41.520 Introduction to Analysis I (3)** Limits, continuity, Bolzano-Weierstrass theorem, uniform continuity, Heine-Borel theorem, differentiability, Riemann and Stieltjes integrals, mean-value theorems, infinite series, sequences of functions. Arzela's theorem, Taylor's theorem, Weierstrass approximation theorem. *Prerequisite:* 41.223.

- 41.521 Introduction to Analysis II (3)** Functions of several variables, partial differentiation, Jacobians; implicit function theorem, line surface, and space integrals, theorems of Gauss, Stokes, and Green; Fourier series. *Prerequisite:* 41.520.
- 41.523 Ordinary Differential Equations (3)** Existence theorems, Riccati equation, solutions in power series, regular and irregular singular points, two-point boundary-value problems, Sturm-Liouville theory, orthogonal functions. *Prerequisite:* 41.321.
- 41.524 Partial Differential Equations (3)** First and second order linear equations, type, characteristics, reduction to normal forms, separation of variables, Poisson's formula, Green's function. *Prerequisite:* 41.523.
- 41.525 Special Functions (2)** Fundamental properties of Gamma and Bessel functions, Legendre, Hermite, Laguerre, and Chebyshev polynomials; hypergeometric functions; asymptotic expansion; determination of zeros. *Prerequisite:* 41.521.
- 41.528 Vector Analysis (3)** Algebra and calculus of vectors; theorems of Green, Gauss, Stokes, applications to differential geometry, mechanics, hydrodynamics, electromagnetism, introduction to tensors. *Prerequisite:* 41.321.
- 41.546 Point-Set Topology (3)** Topological spaces, open and closed sets, compactness, connectivity, metric—, Hausdorff—, and linear normed spaces, topological transformations, separation theorems, Jordan curve theorem, introduction to algebraic topology. *Prerequisite:* 41.520 or concurrent registration.
- 41.620 Complex Variables I (3)** Topological concepts, differentiation and integration of complex-valued functions, analyticity, Cauchy's theorem, Laurent series, singularities, contour integration and residue calculus. *Prerequisite:* 41.521.
- 41.621 Complex Variables II (3)** Analytic continuation, entire functions, conformal mapping, Riemann surfaces, periodic and elliptic functions, Riemann mapping theorem. *Prerequisite:* 41.620.
- 41.622 Real Variables I (3)** Peano's postulates, the real number system, point set theory, transfinite numbers, metric spaces, topological spaces, set functions. *Prerequisite:* 41.521.
- 41.623 Real Variables II (3)** Additive set functions, measure, transformations leaving measure invariant, covering theorems, Lebesgue integral, Lebesgue convergence theorem, L^p -spaces, convergence in mean, Riesz-Fischer theorem. *Prerequisite:* 41.622.
- 41.625 Calculus of Variations (2)** Extremization of integrals, Euler equations, Weierstrass and Jacobi conditions, sufficient conditions for extrema, isoperimetric problems, variable end-points, applications of Rayleigh-Ritz method. *Prerequisite:* 41.521.
- 41.626 Integral Equations (3)** Volterra equations of the first and second kind, Fredholm equations and theorems, symmetric kernels, orthogonal functions, Hilbert-Schmidt theory, applications to boundary value problems, singular integral equations. *Prerequisite:* 41.521.
- 41.634 Functional Analysis (3)** Topological vector spaces, Banach spaces, linear functionals and dual space, W^* -topology, uniform boundedness and closed graph theorems, completely continuous operators, Hilbert space, spectral theorem, unbounded operators. *Prerequisites:* 41.510 and 41.623.

NUMERICAL ANALYSIS AND COMPUTER SYSTEMS

- 41.560 Numerical Analysis I: Basic Problems (2)** Interpolation, finite differences, numerical differentiation, integration, and approximation by orthogonal functions, least squares, asymptotic representations, difference equations, continued fractions, planning tables, optimum interval tables, differencing. *Prerequisite:* 41.223.
- 41.561 Numerical Analysis II: Matrices (2)** Calculation of inverses of matrices by various methods, iterative processes for solving systems of simultaneous linear equations, and determination of eigenvalues and eigenvectors of matrices. *Prerequisite:* 41.510.
- 41.562 Numerical Analysis III: Ordinary Differential Equations (2)** Numerical solution of ordinary differential equations of initial value and boundary value types. Introduction to numerical solution of partial differential equations. *Prerequisites:* 41.321 and 41.560.
- 41.563 Numerical Analysis IV: Partial Differential Equations (2)** Sturm-Liouville problems, expansion theorem, maximum-minimum properties, theorems on asymptotic behavior, iteration methods, Rayleigh-Ritz method, difference methods. *Prerequisite:* 41.562.
- 41.565 Finite Differences (3)** Differences, interpolation, expansion of functions, summation, generating functions, difference equations, numerical integration, graduation and other approximations. *Prerequisite:* 41.223.
- 41.566 Computer Design I (2)** Design of electronic computer systems; components (arithmetic unit, internal memory, control, input-output devices); storage and grating units, number representations and codes, Boolean algebra. *Prerequisite:* advanced work in mathematics and electronics.
- 41.567 Computer Design II (2)** Topics from design of special purpose, general purpose, digital, analog and incremental computers; applications from information theory, switching theory, general information processing and control systems. *Prerequisite:* 41.566.
- 41.568 Computer Programming I (3)** Components of electronic digital computers, number system, computer words, numbers, instructions, address logic, codes, subroutines, problem analysis, scaled operations, flow diagrams, code checking, problem solving. *Prerequisite:* 41.222.
- 41.569 Computer Programming II (2)** Advanced coding, pseudo codes, interpretive routines, floating point operations, double precision operations, input conversion routines, service routines, automatic coding. *Prerequisite:* 41.568.

MATHEMATICAL PHYSICS

- 41.550 Mathematics for Physics I (3)** Fourier series, integrals, and transforms, Laplace transform methods, eigenvalues and diagonalization of matrices, oscillatory systems and normal modes, calculus of variations, special functions. *Prerequisite:* 41.321.
- 41.551 Mathematics for Physics II (3)** Wave equation, vibrating strings and membranes, Laplace's equation, heat equation, complex variables, and contour integration, conformal mapping, tensors. *Prerequisite:* 41.550.

- 41.654 Partial Differential Equations of Mathematical Physics I (2)** Second order hyperbolic equations, characteristics, Cauchy and Goursat problems, Riemann's method, quasi-linear equations, Legendre transformation, wave equation in n -dimensions, spherical means, Hadamard's method. *Prerequisites:* 41.524 and 41.551.
- 41.655 Partial Differential Equations of Mathematical Physics II (2)** Second order elliptic, parabolic, and mixed equations, problems of Dirichlet and Neumann, Green's function, potentials of volume and surface distributions, diffusion phenomena, Tricomi's equation. *Prerequisite:* 41.654.
- 41.656 Mathematical Theory of Fluid Dynamics I (3)** Basic kinematic and dynamic concepts, incompressible fluids, vorticity and circulation theorems, potential and stream function, plane and axially symmetric flows, conformal mapping, aerofoils, vortex lines and streets, jets and free streamline problems. *Prerequisite:* 41.551.
- 41.657 Mathematical Theory of Fluid Dynamics II (3)** Dynamics and thermodynamics of compressible fluids, subsonic, transonic, and supersonic flows, Prandtl-Busemann method, hodograph method, shock waves, viscous fluids, boundary layer theory, and turbulence. *Prerequisite:* 41.656.

SEMINARS

- 41.710 Seminar: Algebra (3)** Research in algebra, involving individual projects. *Prerequisite:* 41.513.
- 41.720 Seminar: Analysis (3)** Research in analysis, involving individual projects. *Prerequisite:* 41.621 or 41.623.
- 41.750 Seminar: Applied Mathematics (3)** Research in applied mathematics, involving individual projects. *Prerequisite:* 41.551.
- 41.797 Master's Thesis Seminar in Mathematics and Statistics (3-6).**
- 41.799 Doctoral Dissertation Seminar in Mathematics and Statistics (3-6).**

STATISTICS

THEORY OF PROBABILITY AND STATISTICS

- 41.570 Analysis for Statistics I (3)** Analysis topics needed for statistics: numbers and points; integrals of analytic functions; uniform convergence; power series; singularities; residues and contour integration. *Prerequisites:* 41.223 and 41.310.
- 41.571 Analysis for Statistics II (3)** Point sets; measurable sets and functions; Lebesgue integrals; differentiation and integration, interchange of order; Lebesgue-Stieltjes integrals; dominated convergence. *Prerequisite:* 41.570.
- 41.574 Theory of Probability I (3)** Foundations of the theory of probability; random variables; distribution functions; generating and characteristic functions. *Prerequisites:* 41.474 and 41.570.
- 41.575 Theory of Probability II (3)** Special distributions, limit theorems, Markoff chains, introduction to stochastic processes. *Prerequisite:* 41.574.
- 69.500 Mathematical Statistics I (3)** Probability concepts; discrete and continuous distributions; expected values and moments; sampling. *Prerequisites:* 41.223, 41.310, 41.474.

- 69.501 Mathematical Statistics II (3)** Point estimators, desirable properties; maximum likelihood; linear estimation, regression, variance analysis; interval estimation and significance tests. *Prerequisite:* 69.500.
- 69.505 Regression and Variance Analysis (3)** Simple and multiple regression; least squares; linear hypotheses; components of variance and mixed models for balanced designs; analysis of covariance and some unbalanced design problems. *Prerequisites:* 41.310 and 69.501.
- 69.510 Theory of Sampling I (3)** Maximizing efficiency of sample surveys; stratification; types of sampling units; sub-sampling; double sampling; biased methods of selection and forms of estimate; precision and bias of results. *Prerequisites:* 41.223 and 69.508 or equivalent.
- 69.511 Theory of Sampling II (3)** Advanced problems of sampling design. Cluster sampling; sub-sampling, types of costs, maximizing information per dollar, probability proportional to size, systematic sampling, restricted sample designs. *Prerequisite:* 69.510.
- 69.571 Sequential Analysis (3)** Sequential versus nonsequential tests of simple and composite hypotheses; subdivision of parameter and sample spaces; Wald's lemma and fundamental identity; OC and ASN functions. *Prerequisite or corequisite:* 69.501.
- 69.578 Stochastic Processes (3)** Birth and death processes; random walks and ruin; Markoff chains and ergodic processes; queueing theory; Fourier analysis; theory of learning and communication. *Prerequisites:* 41.575 and 69.501.
- 69.602 Characteristic Functions (3)** Inversion formulas; limit theorems; uses of characteristic functions to solve distribution problems in statistics. *Prerequisites:* 41.571 and 69.501.
- 69.604 Decision Theory (3)** Convex sets, convex functions, finite games, minimax theorem, s-games, infinite games, statistical games, principles of choice, complete class theorems. *Prerequisite:* 69.501.
- 69.610 Statistical Inference I (3)** States of nature; use of information from random samples; Neyman-Pearson theory; likelihood function, fiducial, and Bayesian inference. *Prerequisite:* 69.501.
- 69.611 Statistical Inference II (3)** Continuation of 69.610 with emphasis on Fisher-Behrens and similar problems; contingency tables; linear estimation. Emphasis on the Bayesian point of view. *Prerequisite:* 69.610.
- 69.620 Multivariate Analysis I (3)** Multivariate normal distribution; estimating and testing the mean vector and covariance matrix; Hotelling's T; Wilks' likelihood ratio criterion; classification problems; principal components; Wishart's distribution. *Prerequisites:* 41.510, 69.501, and 69.505.
- 69.621 Multivariate Analysis II (3)** Canonical correlation; multivariate regression and the general multivariate linear hypothesis; multivariate analysis and introduction to multivariate experimental design. *Prerequisite:* 69.620.
- 69.671 Experimental Design (3)** Mathematical models of design of experiments; factorial designs; randomized blocks; Latin and Graeco-Latin squares; confounding; fractional replication; special topics. *Prerequisites:* 69.505 and 41.510.

- 69.680 Advanced Mathematical Statistics I (3)** General theory of random variables and probability distributions; advanced topics in theory of sampling and statistical inference. *Prerequisites:* 41.570, 41.571, 41.575, and 69.611.
- 69.681 Advanced Mathematical Statistics II (3)** Continuation of 69.680. *Prerequisite:* 69.680.
- 69.790 Seminar in Statistical Theory and Probability (3)** Advanced topics will be considered according to the needs of the students. *Prerequisite:* 69.681 or permission of the department.

APPLIED PROBABILITY AND STATISTICS

- 69.502 Regression Analysis (3)** Simple, partial, and multiple linear regression; least squares; curve fitting; graphic techniques; significance tests and confidence intervals for regression and correlation coefficients. *Prerequisite:* One year of statistics.
- 69.507 Statistical Methodology I (3)** Basic statistical concepts; sampling distributions; assumptions underlying various statistical techniques; uses of chi-square and t-distributions. *Prerequisite:* One year of statistics.
- 69.508 Statistical Methodology II (3)** Simple, partial, and multiple regression and correlation; uses of F-test in analysis of variance and covariance with several designs; nonparametric methods; decision theory. *Prerequisite:* 69.507.
- 69.552 Advanced Psychological Statistics (3)** Psychological research models; significance of differences; analysis of variance and covariance; scales; nonparametric tests, power; validity and reliability; Spearman-Brown, Kuder-Richardson and attenuation techniques. *Prerequisite:* 69.301.
- 69.570 Quality Control (3)** Control charts for mean, range, defects and fraction defective; acceptance sampling for attributes and variables; cost and quality comparisons; alternative plans. *Prerequisite:* One year of statistics.
- 69.572 Design of Experiments (3)** Randomized blocks, two- and three-way classification, Latin square and factorial experiments; models involving components of variance, disproportionate frequencies, analysis of covariance and confounding. *Prerequisite:* One year of statistics.

INTER-DEPARTMENTAL SCIENCE PROGRAM

Professor: MATTHEW F. NORTON (Chairman, Division of Natural Sciences and Mathematics). Faculty of the Departments of Biology, Chemistry, Earth Sciences, Mathematics, and Physics.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Science in Distributed Sciences

The University offers a program leading to the degree of Bachelor of Science with a major in Distributed Sciences for students who plan to teach the natural sciences in secondary schools or who wish to receive a broader background in science at the undergraduate level than is afforded by the usual Bachelor of Science degree. The degree is also planned to meet most pre-medical and pre-dental requirements. Students majoring in distributed sciences select their major courses primarily from offerings in the fields of biology, chemistry, earth sciences, mathematics, and physics; pre-medical and pre-dental students are advised to elect certain courses in psychology for their fourth science. Students interested in a program in distributed sciences should consult the chairman of the science department in which they select the 24 hours of major courses. The chairman of that department will assign an adviser.

University Requirements 38-43 hours

Language Requirement 12 hours

Divisional Requirements:

Major courses 36 hours

At least 24 hours in one science; at least 12 in another.

Related courses 16 hours

Eight hours in each of two additional sciences. (Where mathematics and/or psychology is selected certain courses are specified.)

Tool courses 6 hours

41.110, 41.111 Fundamentals of Mathematics I and II.

Electives to complete 126 hours

Graduate Degree—Master of Science in Science Teaching

Administered under the joint supervision of the Division of Natural Sciences and Mathematics and the Department of Education. Students interested in the M.S.S.T. program should consult the chairman of the science department in which they will take their major. The chairman of that department will assign an adviser.

Course Requirements: Minimum of 30 hours of approved graduate work with six or more hours taken in the major field. The student's undergraduate and graduate courses in the major field must total a minimum of 32 credit hours. Other requirements include (a) a minimum of eight hours in a second science field, (b) one year of college mathematics (algebra and analytic geometry or equivalent)

taken either before entering the M.S.S.T. program or as non-credit courses along with the courses taken for graduate credit, (c) a course in either history or philosophy of science (3), and (d) six hours of graduate courses in education. A limited number of courses (not to exceed 12 hours) from the 300 to 400 level may be used toward the requirements of this degree. These courses may be selected from 9.307, 9.410, 15.310-311, 15.320-321, 15.350-351, 15.360-361, 27.321-322, 27.331-332, 27.341-342, 41.310-311, 41.321, 41.440, 41.474, 51.320-321, 51.322-323, 51.330-331, 51.370, 51.450-451.

Written Comprehensive Examinations: Three, including two fields in the natural sciences and one field in education.

DIVISIONAL COURSES

Professor: MATTHEW F. NORTON (Chairman, Division of Natural Sciences and Mathematics). *Adjunct Professor:* RAYMOND J. SEEGER.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

81.506 History of Scientific Thought I (3)

History of major scientific concepts. Covers the Greek Science, the Transition Period, Science in the Scholastic Period, the Galileo Period, and the Newtonian Period. Primarily Biological and Physical Sciences.

81.507 History of Scientific Thought II (3)

Scientific concepts since the Newtonian Period, the Franklin Period, the 19th century, and the 20th century to the present time. Continuation of 81.506. Either or both semesters may be taken for credit.

HOSPITAL TRAINING PROGRAMS

Sibley Memorial Hospital

Paul R. Curtis, Coordinator

The University provides the academic courses for students enrolled in the Lucy Webb Hayes School of Nursing of Sibley Memorial Hospital. The schedule of courses is as follows:

- 9.102 Human Anatomy (3)
- 9.103 Elementary Bacteriology (3)
- 9.104 Human Physiology (3)
- 15.105 Elementary Chemistry (3)
- 57.200 General Psychology (3)
- 65.200 Introduction to Sociology (3)

Washington Hospital Center

Sumner O. Burhoe, Coordinator

The University provides the academic courses for students enrolled in the three year diploma program of the Washington Hospital Center. The schedule of courses is as follows:

- 45.101 Basic Physical Science (4)
- 45.102 Basic Biological Science (4)
- 45.105 Human Growth and Development (3)
- 23.100 Composition and Reading I (3)
- 23.101 Composition and Reading II (3)
- 57.200 General Psychology (3)
- 65.200 Introduction to Sociology (3)
- 21.320 Psychology of Education (3)
- 53.200 American Government: National (3)
- 19.200 Introduction to Economics (3)



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DIVISION OF SOCIAL SCIENCES

ANTHROPOLOGY
ECONOMICS
HISTORY
POLITICAL SCIENCE
PSYCHOLOGY
SOCIOLOGY

ECONOMICS

Professors: ERNST CORRELL (Emeritus); MARVIN L. FAIR; PHILIP M. KAISER; FRITZ KARL MANN (Emeritus); LEON C. MARSHALL (Emeritus); SIMON NAIDEL; FRANK M. TAMAGNA; AMOS E. TAYLOR. *Associate Professors:* W. DONALD BOWLES (Chairman); HAROLD WOLOZIN. *Assistant Professors:* JAMES H. WEAVER; WILLIAM M. WENDT. *Adjunct Professors:* QUINCY ADAMS; EDWARD L. ALLEN; LLOYD D. BLACK; W. DUANE EVANS; PAUL FISHER; J. HERBERT FURTH; WARREN S. HUNSBERGER; GEORGE JASZI; GUSTAV PECK; MURRAY ROSS; ROBERT SOLOMON; DANIEL L. SPENCER; SEYMOUR WOLFBEIN. *Professorial Lecturers:* HOWARD K. AMMERMAN; L. JAY ATKINSON; FREDERICK DIRKS; MANUEL EBER; MERRILL GAY; WILLIAM S. JOHNSON; SAMUEL I. KATZ; ORVILLE J. MCDIARMID; HERMAN MILLER; WILLARD F. MUELLER. *Lecturers:* NICHOLAS C. ANAGNOS; SUSAN S. BURR; GEORGE N. ECKLUND; RUSH GREENSLADE; HERMAN P. LIEBLING; PETER K. WAGNER.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements 38-43 hours

Students majoring in economics are advised to complete 41.100 Survey of Mathematics I or 41.110 Fundamentals of Mathematics I as part of their University requirements.

Language Requirement 12 hours

Departmental Requirements: 30 hours

Substantive courses (24 credits): 19.200 Introduction to Economics I (3), 19.300 Introduction to Economics II (3), 19.301 Intermediate Economic Analysis: Price (3), 19.302 Intermediate Economic Analysis: Income (3), 19.304 Landmarks of Economic Theory (3), 19.312 Money and Banking (3), 19.322 American Economic Development (3), 19.400 International Economics (3).

Quantitative courses (6): 69.202 Basic Statistics (3), 19.307 Introduction to Quantitative Economics (3).

Related courses 12 hours

Advanced work selected from the following fields, with not more than nine hours in any one: anthropology, business administration, education, government, history, international relations, mathematics, philosophy, psychology, public administration, sociology.

Note: Grade of C or better is required in all departmental and related courses. Students planning to continue on to graduate work in economics are advised to take mathematics as a related field.

Electives to complete 126 hours

It is suggested that the entire last semester of the senior year be composed of electives. All 500-level courses in the department are open to undergraduates with the necessary prerequisites. In general, a student should not use his electives entirely in his own field but should strengthen his overall educational program. At least 18 hours of electives must be at the 300-level or above. If the student elects to take work in economics beyond the minimum, the following economics courses

are suggested: 19.303 Business Cycles; 19.403 Labor Economics; 19.529 Economics of Public Finance; 19.543 Industrial Organization and Public Policy; 19.584 Structure and Operation of the Soviet Economy or 19.595 Comparative Economic Systems. For some purposes, Accounting I and II are useful electives.

Graduate Degrees—Master of Arts; Doctor of Philosophy

MASTER OF ARTS

Admission: Admission to graduate work in economics is contingent on the student's prior completion of the equivalent of the courses cited as undergraduate departmental requirements, including statistics and an introductory course in quantitative economics. Under special circumstances a student may be admitted to the graduate program with a maximum of two undergraduate deficiencies which must be made up in the first year of graduate work.

Course Requirements: Minimum of 30 hours of approved graduate work, including 19.797 Master's Thesis Seminar (6) or two non-thesis Seminars at the 700-level (3-3).

Written Comprehensive Examinations: Two, including one in contemporary economic theory, and one in a specialized field of economics or economic history. See the departmental information sheet on suggested minimal course preparation for the individual comprehensive fields.

Other Requirements: Thesis, and oral defense of thesis; or completion of two 700-level Research Seminars with grade of B or better. All students must have taken in the recent past a basic course in statistics and a basic course in quantitative economics. Lacking such courses, the student will normally take 69.202 Basic Statistics and 19.307 Introduction to Quantitative Economics for no credit inasmuch as these are undergraduate courses, although the student must earn a grade of C or better in each course. All qualified students are urged to take 19.507 Quantitative Economic Analysis as part of their regular program.

DOCTOR OF PHILOSOPHY

Admission: Direct admission to the Ph.D. program is contingent on the student's having an M.A. degree or approximately its equivalent in economics from The American University or from another school. All other students will first register as Master's students and, when that program is completed, apply for admission to the Ph.D. program. It may be noted that this does not in any way lengthen the time required to achieve the Ph.D. degree at this University.

Course Requirements: Minimum of 72 hours of approved graduate work with a better-than-B grade average, including 19.799 Doctoral Dissertation Seminar (6). At least 36 (including dissertation credit) of the 72 hours must be completed in residence at The American University.

Written Comprehensive Examinations: Five, including one in contemporary economic theory, one in history of economic thought, one in economic history (U.S. or European), one in a specialized field of economics, and one in some other specialized field of economics or in a related field. The related field must be chosen with the approval of the department chairman on the advice of the student's departmental adviser and the department in which courses in the related field are given. See the departmental information sheet for suggested minimal course preparation for the individual comprehensive fields.

Other Requirements: Proficiency in two research tools (one modern foreign language and statistics or mathematics); the foreign language will normally

be that in which a significant body of literature in the student's major field lies. Dissertation and oral defense of dissertation. All students must have completed a basic course in quantitative economics (19.307 or 19.507) at this University.

Graduate Comprehensive Examination Fields

19.1 Contemporary Economic Theory (required of M.A. and Ph.D. students), 19.2 History of Economic Thought (required of Ph.D. students), 19.3 Economic History of Europe, 19.4 Economic History of the United States (19.3 or 19.4 required of Ph.D. students), 19.5 Economic Fluctuations, 19.6 Industrial Organization and Public Policy, 19.7 Economic Development, 19.8 Labor Economics and Policy, 19.9 International Economics, 19.10 Economics of Underdeveloped Areas, 19.11 Comparative Economic Systems, 19.12 The Soviet Economy, 19.13 Monetary Economics, 19.14 Public Finance and Fiscal Policy, 19.15 National Income and Social Accounting, 19.16 Mathematical Economics (may not be taken with 19.17), 19.17 Econometrics (may not be taken with 19.16), 19.18 Land Economics. In general, the fields and requirements cited in previous catalogs will be approved only on specific request from candidates who began their work towards the degree being sought before August 31, 1963.

UNDERGRADUATE COURSES

- 19.200 Introduction to Economics I (3)** Institutional framework. Fundamental aggregative relationships of income, consumption, investment. Includes resources, economic growth, public and private finance, national income, business cycles, national economic policy.
- 19.300 Introduction to Economics II (3)** Elementary theory of price, forms of imperfect competition, income distribution, public policy, international economics, comparative economic systems. *Prerequisite:* 19.200.
- 19.301 Intermediate Economic Analysis: Price (3)** Theory of relative prices of commodities and productive services under perfect and imperfect competition. *Prerequisite:* 19.300.
- 19.302 Intermediate Economic Analysis: Income (3)** Basic concepts and theory of income, employment, and economic growth. *Prerequisite:* 19.300.
- 19.303 Business Cycles (3)** Historical, theoretical analysis of the fluctuations in economic activity. An introduction to dynamic economics. *Prerequisite:* 19.300.
- 19.304 Landmarks of Economic Theory (3)** History of the development of economic thought as exemplified by the writings of Smith, Ricardo, Mill, Marx, Marshall, Veblen, Keynes; historical settings in which their ideas developed. *Prerequisite:* 19.300.
- 19.307 Introduction to Quantitative Economics (3)** Selected topics from analytical geometry, calculus, linear algebra, statistics, and their application to problems in economic research and analysis. *Prerequisites:* 41.100 and 69.202.
- 19.311 Financial Organization of Society (3)** Evolution and present structure of the monetary and financial organization of society; the banking system and the central bank; other financial institutions and securities market. *Prerequisite:* 19.300.

- 19.312 Money and Banking (3)** Role of money and credit in the economy. The structure of the money market. Structure and operations of commercial banks. The Federal Reserve System and instruments and processes of monetary policy. Introduction to monetary theory. *Prerequisite:* 19.300.
- 19.321 European Economic Development (3)** Origin, development, present status of economic institutions. Trends in population, living standards, output, and technology. *Prerequisite:* 19.300.
- 19.322 American Economic Development (3)** Topical approach to U.S. economic growth emphasizing structure of the economy and important institutional patterns of organization. *Prerequisite:* 19.300.
- 19.400 International Economics (3)** Basic factors in the functioning of the world economy, economic principles underlying international trade, international payments, determination of exchange rates, and capital transfers. *Prerequisite:* 19.300.
- 19.403 Labor Economics (3)** Labor markets and wage structure. Collective bargaining. Wage theories and policies. Labor productivity, real wages, income, employment, unemployment. *Prerequisite:* 19.300.
- 19.446 Introduction to Business Economics (3)** Introduction to major sectors of economics most useful to business executives. The economy: its indicators, measures, fluctuations. The firm; economic tools for decision making. *A review course open to graduate students in the School of Business only.*

ADVANCED COURSES

(500-level courses are open to graduate students and qualified advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

ECONOMIC THEORY

- 19.509 Economic Thought I: Early Period Through 1870's (3)** Origins of classical economics. Development of classical thought from Adam Smith through John Stuart Mill. *Prerequisites:* 19.301 and 19.302.
- 19.510 Economic Thought II: Modern Period (3)** Evolution of modern economic theory from the "marginalists" to the recent past, excluding diverging schools. *Prerequisite:* 19.509.
- 19.511 Economic Thought III: Diverging Schools (3)** History of economic thought since 1800 with emphasis on socialist, historical, and institutionalist schools. *Prerequisites:* 19.509 and 19.510.
- 19.512 Price Analysis I: Prices and Production (3)** Theory of commodity pricing. Analysis of demand functions, supply functions, and the equilibrium of the consumer, the firm, and the industry under various market situations and time dimensions. *Prerequisite:* 19.301.
- 19.513 Price Analysis II: Income Distribution (3)** Extension of commodity price theory to the valuation of productive services and resources. Problems of comparative statics, dynamics, and stability. General economic equilibrium and the problem of resource allocation. *Prerequisite:* 19.512.

- 19.514 Income Analysis I: Concepts and Theory (3)** Analysis of economic aggregates. The multiplier and acceleration principle. Interrelationship between prices, money supply, interest rates, output. *Prerequisites:* 19.302 and 19.312.
- 19.515 Income Analysis II: Analysis and Application (3)** Keynesian and post-Keynesian economics. Theoretical forerunners and modern refinements. Applications to business cycles, economic development, public policy. *Prerequisite:* 19.514.
- 19.516 Theory of Economic Development (3)** Development of capitalism and its long-term outlook. Role of business enterprise, technology, population growth, international relations, financial institutions, the relations between capital and labor. *Prerequisites:* 19.301 and 19.302.
- 19.517 Economic Planning: Income Stabilization (3)** Public policies relating to the stabilization of national income. Budgetary, fiscal, monetary, and debt management policies. The application of flexible fiscal policy in the fields of spending and taxation. *Prerequisite:* 19.515.
- 19.612 Advanced Economic Analysis: Price (3)** Examination in depth of selected problems and topics in price theory. *Prerequisite:* 19.513.
- 19.613 Advanced Economic Analysis: Income (3)** Examination in depth of selected problems and topics in income theory. *Prerequisite:* 19.515.
- 19.614 Welfare (Normative) Economics (3)** Welfare implications of economic theory as applied in public policy. The system of welfare equations and the problem of optimum resource allocation. *Prerequisite:* 19.513.
- 19.615 Theory of Economic Fluctuations (3)** Advanced analysis of cycles in the general level of business activity. Business cycle theories. Implications for social control of the cycle nationally and internationally. *Prerequisite:* 19.515.
- 19.616 Advanced Theory of Economic Development (3)** Patterns, theories and models of economic development of advanced and underdeveloped economies. Some historical theories and approaches to economic development. Theoretical concepts and issues in development planning. *Prerequisite:* 19.516.
- 19.619 Economics of American Development (3)** A statistical and analytical investigation of long-run behavior of national income, population, savings, investment, consumption, labor productivity, and other factors affecting economic growth in the U.S. The problem of social control of the growth rate. The concepts of dual economy and balanced growth. *Prerequisite:* 19.516.

QUANTITATIVE ECONOMICS

- 19.507 Quantitative Economic Analysis (3)** Intermediate mathematical and statistical analysis of economic phenomena. Elements of model building, input-output, game theory, and linear programming. *Prerequisite:* 19.307 and permission.
- 19.518 Social Accounting (3)** Social accounting systems and their uses, as employed in economic analysis: national income, input-output techniques, flow of funds, international balance of payments. *Prerequisites:* 19.301 and 19.302.

- 19.547 Theory of Economic Forecasting (3)** Theoretical tools and techniques required for appraisals of economic outlook. Quantitative analysis of business cycles, fluctuations of income and employment. Economic indicators. *Prerequisites:* 19.303 and 19.307.
- 19.607 Mathematical Economics (3)** Application of mathematical methods to the study of economics. Advanced study of static and dynamic models. *Prerequisites:* 19.507, Calculus I and II, and Higher Algebra I (41.222, 41.223, 41.310), and permission.
- 19.608 Econometrics (3)** Advanced quantitative analysis. Construction of stochastic economic models. Problems of specification, estimation, verification, and prediction. *Prerequisites:* 19.507, Calculus I and II, Higher Algebra I (41.222, 41.223, 41.310), and permission.
- 19.620 National Income and Wealth (3)** Concepts, sources, methods used in measuring and analyzing national income, income payments, national product, capital formation, consumer expenditures, savings, wealth. *Prerequisite:* 19.518.

MONEY, CREDIT, BANKING

- 19.520 Monetary Theory and Policy (3)** Money and credit as factors influencing income, prices, employment, and balance of payments. The structure and role of interest rates. Monetary equations and the role of money velocity. Liquidity preference in relation to quantity of money. *Prerequisite:* 19.312.
- 19.524 The Financial Markets (3)** Nature and functions of money and capital markets and their interrelation. Financial institutions and their operations and instruments. The process of monetary policy, including diffusion of effects of Federal Reserve policy through the money and capital markets. Comparative reference to related foreign institutions and practices. *Prerequisite:* 19.312 or 10.466.
- 19.596 International Finance and Capital Movements (3)** Balance of payments accounts. Modern theories concerning interrelations between price level, balance of payments, and capital movements. Foreign exchange markets, foreign investments and capital movements. International financial organizations. *Prerequisites:* 19.312 and 19.400.
- 19.621 Theory and Management of Central Banking (3)** Evolution of central banking and comparative institutional analysis. Relations to government and processes of monetary policy formulation. Quantitative and qualitative instruments of monetary policy. The role of central banks in internal economic policy and international economic relations. *Prerequisite:* 19.520.

PUBLIC FINANCE

- 19.529 Economics of Public Finance (3)** Principles of budgeting, public spending, debt management, fiscal policy. Comparative survey of fiscal institutions in the U.S. and abroad. *Prerequisites:* 19.301 and 19.302.
- 19.530 Fiscal Theory and Policy (3)** Government financing and fiscal control. Fiscal policies and their welfare implications. Fiscal policy to advance economic stabilization and full employment. *Prerequisite:* 19.302, 19.312.

- 19.632 Advanced Fiscal Theory (3)** Discussion of selected problems of fiscal theory: compensatory finance, fiscal dynamics, debt policy, etc. *Prerequisite:* 19.530.

INTERNATIONAL AND REGIONAL ECONOMICS

- 19.525 Economic and Political Geography of Underdeveloped Areas (3)** Population, territorial framework, resources, industries of areas included in foreign aid program. Plans, policies, problems projected on geographical setting. *Prerequisite:* A basic course in world geography.
- 19.580 International Economics I (3)** Theory of international specialization, world trade and development, commercial policy and international economic relations. *Prerequisite:* 19.400.
- 19.581 International Economics II (3)** The balance of payments, international economic equilibrium, international investment and development, U.S. foreign economic policies. *Prerequisite:* 19.580.
- 19.582 Economics of Underdeveloped Countries (3)** Trends in living standards, capital formation, industrial-agricultural techniques, monetary and fiscal structures, income distributions, foreign trade of underdeveloped countries. *Prerequisites:* 19.400 and 19.516.
- 19.583 Economic Problems of Western Europe (3)** Economic resources, population, financial and fiscal systems. Role of government and private enterprise. Inter-European economic organizations and their relations to the U.S. and to underdeveloped countries. *Prerequisite:* 19.400.
- 19.584 Structure and Operation of the Soviet Economy (3)** Rate of economic growth, changing structure of economy with emphasis on period since 1928. Conditioning factors. Planning techniques and procedures. International economic relations. *Prerequisite:* 19.300.
- 19.585 Economic Problems of the Middle East (3)** Economic geography, population, government organization, public finance and monetary policy, foreign trade, balance of payments, foreign investments, prospects of economic advancement. *Prerequisite:* 19.582.
- 19.586 Economic Problems of Asia (3)** Economic geography, population, government organization, public finance and monetary policy, foreign trade, balance of payments, foreign investments, prospects of economic advancement. *Prerequisite:* 19.582.
- 19.587 International Economic Problems Confronting the United States (3)** Formulation, execution of foreign economic policies and programs. International economic and trade position of the U.S.. Foreign assistance and underdeveloped area programs. *Prerequisite:* 19.400.
- 19.588 Economic Problems of Latin America (3)** Economic geography, population, government organization, public finance and monetary policy, foreign trade, balance of payments, foreign investments, prospects of economic advancement. *Prerequisite:* 19.582.
- 19.589 Economic Problems of the Soviet Union (3)** Economic geography, population, government organization, public finance and monetary policy, foreign trade, balance of payments, foreign investments, prospects of economic advancement. *Prerequisite:* 19.584.

- 19.593 Economic Problems of Africa (3)** Economic geography, government organization, public finance and monetary policy, foreign trade, balance of payments, foreign investments, prospects of economic advancement. *Prerequisite:* 19.582.
- 19.595 Comparative Economic Systems (3)** Principles governing pricing, income distribution, productivity, investment, economic stability, growth under various forms of social, political, and economic organization. *Prerequisite:* 19.300.
- 19.680 Advanced International Economics (3)** Examination in depth of selected problems and topics in international economics. *Prerequisite:* 19.581.

INDUSTRIAL ORGANIZATION AND PUBLIC POLICY

- 19.541 Economics of American Industry (3)** Survey of principal manufacturing industries of the U.S. Emphasis on sources of data and on the development of a workable technique of industry analysis. *Prerequisite:* 19.301.
- 19.543 Industrial Organization and Public Policy (3)** Extent and forms of imperfect competition in the American economy. Objectives, methods, techniques, and rationale of government influence and control. International comparisons. *Prerequisite:* 19.301.
- 19.544 Public Utility Economics (3)** Introduction to public utility problems. History, operation, finance, rates of public utilities. Government regulation, operation. *Prerequisite:* 19.543.

LABOR ECONOMICS

- 19.550 History of the U.S. Labor Movement (3)** Causes and results of organized efforts to regulate the conditions of work and the well-being of workers. Political, economic objectives; social problems surrounding the labor movement. *Prerequisite:* 19.403.
- 19.551 History of the European Labor Movement (3)** Development of the labor movement in Europe. Comparative historical view of trade union ideologies, objectives, structure, methods. International trade union federations. *Prerequisite:* 19.403.
- 19.552 Labor Economics (3)** Trends affecting the position of labor in modern society. Problems related to the determination of wages, hours, working conditions, social security. Role of productivity, labor mobility, and industrial organization on wage determination in the firm and in the economy. Critical evaluation of contemporary wage theory. *Prerequisite:* 19.403.
- 19.553 Current Labor Problems (3)** Union policies with respect to pensions, insurance, the guaranteed wage, incentive systems, profit sharing, adjustments for living costs and productivity, etc. Non-economic provisions in labor contracts. *Prerequisite:* 19.552.
- 19.554 Comparative Labor Relations (3)** Comparative analysis of the status of labor and of labor relations in selected foreign industrialized and unindustrialized countries. Includes labor-management relations, labor-government relations, political parties and labor legislation. *Prerequisite:* 19.403.
- 19.555 Labor and the Law (3)** Actions of legislatures, courts, administrative agencies with respect to unions, their activities and responsibilities. Current legal problems of organized labor. *Prerequisite:* 19.403.

- 19.557 Labor Statistics: Labor Force (3)** Critical analysis of information on occupational descriptions and classifications, industrial classifications, industrial censuses, employment, payrolls, absenteeism, and unemployment. *Prerequisite:* 19.403.
- 19.558 Labor Statistics: Wages and Productivity (3)** Wage rates, union scales, vacations, retirement. Prices and real wages. Sources, methods of collection, analysis, and presentation. *Prerequisite:* 19.403.

SEMINARS

- 19.710 Seminar in Economic Theory (3)** Advanced analysis of problems in the theory of value and distribution, welfare economics, income determination, and economic development. Discussion and supervised research. *Prerequisite:* permission of instructor.
- 19.712 Seminar in Research Methods and Applications (3)** Basic methodological problems in research: workshop in research in selected economic areas. Discussion and supervised research. *Prerequisite:* permission of instructor.
- 19.713 Seminar in National Economic Policy (3)** Economic aspects of leading problems in public policy. Formulation of national economic policy: planning principles and data bases. Discussion and supervised research. *Prerequisite:* permission of instructor.
- 19.770 Seminar in Monetary Economics (3)** Economic and monetary trends and their interrelationship. Federal Reserve policies and government financial operations and their effects on money and capital markets. Review of current economic indicators and monetary and financial statistics; their use for business and monetary analysis. Discussion and supervised research. *Prerequisite:* permission of instructor.
- 19.780 Seminar in International Finance (3)** Use of the balance of payments and international financial accounts for monetary and economic analysis. Current trends in international payments, with particular reference to financial operations of U.S. government agencies and international institutions. Developments in exchange and capital abroad. Discussion and supervised research. *Prerequisite:* permission of instructor.
- 19.781 Seminar in International Economics (3)** Advanced study of basic factors in the formulation of international policies and theories relating to trade, tariffs, prices, foreign investments, foreign aid, regional economic organizations, and related topics. Discussion and supervised research. *Prerequisite:* permission of instructor.
- 19.783 Seminar on the Economy of the Soviet Union (3)** Advanced study of economic growth, planning techniques, and institutional structure of the Soviet Union. Discussion and supervised research. *Prerequisite:* permission of instructor.
- 19.785 Seminar in Economic Problems of the Far East (3)** Advanced study of the problems of economic organization, economic planning, and development in the countries of the Far East. Discussion and supervised research. *Prerequisite:* permission of instructor.
- 19.789 Seminar in Economic Development (3)** Advanced study of the problems of underdeveloped countries. Discussion and supervised research. *Prerequisite:* permission of instructor.

- 19.797 Master's Thesis Seminar (3-6).
- 19.799 Doctoral Dissertation Seminar (3-6).

RELATED COURSES IN OTHER DEPARTMENTS

- 75.540 Management Problems of International Agencies (3-6).
- 75.572 History of the International Labor Movement (3).
- 75.574 Labor and Manpower Problems of American Business Overseas (3).
- 75.575 Social and Labor Problems of Underdeveloped Areas (3).
- 75.520 Automatic Data Processing Systems (3).
- 75.521 Problems of Automatic Data Processing Systems (3).
- 75.557 Operations Research in Management (3).
- 75.763 Seminar in Automatic Data Processing Systems (3).
- 29.548 American Economic History I (3).
- 29.549 American Economic History II (3).
- 29.550 History of Industry in the United States (3).
- 29.551 History of Agriculture in the United States (3).
- 75.588 Regional Organization of Western Europe (3).
- 12.460 Principles of Transportation (3).
- 12.571 Trends and Problems in Transportation (3).
- 12.760 Seminar in Transportation (3).

HISTORY

Professors: CARL G. ANTHON (Chairman); DAVID J. BRANDENBURG; HAROLD E. DAVIS; DONALD DERBY; ARTHUR A. EKIRCH, JR.; DOROTHY D. GONDOS; LOUIS C. HUNTER; ERNST POSNER (Emeritus); SAMUEL L. SHARP. *Associate Professors:* JOHN J. FINAN; WILLIAM HUTCHISON; ALBERT D. MOTT. *Assistant Professors:* WILLIAM HASKETT; CHARLES H. HEIMSATH; S. WHITTLE JOHNSTON; F. JACKSON PIOTROW; ROBERT SHIPKEY. *Adjunct Professors:* KERIM K. KEY; WILCOMB E. WASHBURN. *Professorial Lecturers:* ELIZABETH L. EISENSTEIN; F. GUNTHER EYCK; IRVING I. KRAMER; EDITH LOWRY; STANLEY NEHMER; WAYNE D. RASMUSSEN; WALTER RUNDELL. *Lecturers:* THOMAS V. DiBACCO; RUTH B. DINBERGS; DOROTHY B. GOODMAN; ARNOLD H. PRICE; CLAUDIA R. UPPER; LELIA E. WASHBURN.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements 38-43 hours

Language Requirement 12 hours

Departmental Requirements:

Major Courses 36 hours

Survey courses in American and European history (12); 29.482 Historiography (3); 29.492 Senior Undergraduate Seminar (3); and 18 additional hours in history at the 300-500 level.

Related Courses 18 hours

Advanced (300-500 level) humanities, social sciences or natural sciences.

Electives to complete 126 hours

Graduate Degrees—Master of Arts; Doctor of Philosophy

MASTER OF ARTS

Course Requirements: Minimum of 30 hours of approved graduate work, including 29.797 Master's Thesis Seminar (3-6) and at least one 700-level Research Seminar (3).

Written Comprehensive Examinations: Three, including one in a core field (history of Europe, the U.S., the Far East, or Latin America); one in a specialized field of history (the history of a particular nation or area, a period of history, or a special phase in the history of a nation, area, period, or aspect of history); and one either in another specialized field of history or in a related field of the humanities or the social sciences.

Other Requirements: Thesis and oral defense of thesis.

DOCTOR OF PHILOSOPHY

Course Requirements: Minimum of 72 hours of approved graduate work, including 29.799 Doctoral Dissertation Seminar (3-6). At least 36 (including dissertation credit) of the 72 hours must be completed in residence at The American University. Eighteen hours must be in courses numbered 600 and

above (including at least six in historical research seminars) and no less than 54 hours of the total of 72 hours must be in the fields of the comprehensive examinations.

Written Comprehensive Examinations: Five, including two in core fields, two in specialized fields of history, and one in a related field of the humanities or social sciences.

Other Requirements: Proficiency in two tools of research (foreign languages). Dissertation and oral defense of dissertation.

Graduate Comprehensive Examination Fields

Core Fields. 29.1 History of Modern Europe, 29.2 History of the United States, 29.3 History of Latin America, 29.4 History of the Far East.

Specialized Fields. 29.10 History of Germany, 29.11 History of France, 29.12 History of England, 29.13 History of Russia, 29.14 History of the Middle East and North Africa, 29.15 History of China, 29.16 History of Japan, 29.17 History of South and Southeast Asia, 29.18 Renaissance and Reformation (to 1648), 29.19 The French Revolution and Napoleon, 29.20 History of Europe, 1815-1914, 29.21 History of Europe Since 1914, 29.22 The Colonial Period, Revolution and Constitution, 29.23 The Middle Period of U.S. History (1789-1850), 29.24 Civil War and Reconstruction, 29.25 Recent United States History (since the 1890's), 29.26 The Colonial Origins of Latin America and the Achievement of Independence, 29.27 Latin America since the mid-19th Century, 29.28 European Diplomatic History, 1815 to date, 29.29 European Intellectual History, 29.30 U.S. Intellectual History, 29.31 U.S. Diplomatic History, 29.32 Latin American Intellectual History, 29.33 Latin American Diplomatic History.

UNDERGRADUATE COURSES

29.100 Backgrounds of Civilization I (3) Introduction to historical studies. The U.S. as a phase of western civilization. Expansion of Europe; economic and social background; man and the state.

29.101 Backgrounds of Civilization II (3) The U.S. studied with reference to religious history, the growth and implications of modern thought, science, technology, and the quest for world order.

29.310 The Ancient World (3) Origin and nature of early near-eastern and Greek cultures. Economic, social, and political history of the Roman World.

29.311 Medieval Europe (3) Formative period of European civilization. Transition of social life and political institutions from the Roman Empire to the age of European discovery and exploration.

29.312 History of Europe I (3) Nature, causes, social consequences of the Reformation. Catholic Counter-Reformation. Evolution of political ideologies and institutions. Expansion of commerce and the growth of empires. French Revolution.

29.313 History of Europe II (3) Development of European nationalities from 1815 to 1914. Metternich reaction, rise of liberalism, industrial revolution, and social, cultural, and economic bases of nationalism and imperialism.

- 29.320 History of England I (3)** Political, economic, social, and cultural life in England to 1689. Origins and development of constitutional government. Beginnings of empire. Correlation with pre-law studies and English literature.
- 29.321 History of England II (3)** England and the British Empire since 1689. Evolution of constitutional government, expansion of empire, the empire system since World War II. Correlation with pre-law studies and English literature.
- 29.330 Introduction to Chinese Civilization (3)** Survey of Chinese civilization from beginnings to modern times. Emphasis on cultural, political, social aspects and on relations between China and the western world.
- 29.340 History of the U.S. I (3)** Survey course giving a comprehensive history of our country from colonial times to the Civil War.
- 29.341 History of the U.S. II (3)** Survey course covering period from the Civil War to the present.
- 29.443 Social History of the U.S. I (3)** Social factors in U.S. history from colonial times to the Civil War. Emphasis upon the family, labor, immigration, slavery, religion, the westward movement.
- 29.444 Social History of the U.S. II (3)** Analysis of American society since the Civil War with special attention to social classes and ethnic groups, urbanization, industrialism, technology, the social gospel, popular recreation.
- 29.471 Civilization in the Americas: National Development (3)** Backgrounds of independence. Growth of American nations since 1825. Inter-American relations and the Pan-American movement. The Americas in recent world affairs.
- 29.482 Historiography (3)** Methods and materials of history and an introduction to the major historians from the Greeks to the present.
- 29.492 Senior Undergraduate Seminar (3).**

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

HISTORIOGRAPHY AND METHODS OF RESEARCH

- 29.501 History of European Historical Writing (3)** Development of historiography from the period of the Renaissance. Trends in historical thinking, research and writing. Discussion of representative historical works.
- 29.503 Historical Writing in the U.S. (3)** Analysis of historical writing in the U.S. from colonial times. Attention to prominent historians and trends in historical thinking and interpretation.
- 29.504 Philosophy of History (3)** Contemporary issues in the philosophy of history with special attention to problems of meaning and structure in the historical process, considered in the light of their historical roots. *Prerequisite:* Three hours of philosophy.

EUROPE

- 29.509 Renaissance and Reformation (3)** Political and social history of Europe in the 15th and 16th centuries. Transition of Europe from medieval to modern times; impact of explorations and the Reformation. Rise of capitalism.
- 29.510 French Revolution and Napoleon (3)** European history from 1789 to 1815. Significant aspects of the French Revolution, the Napoleonic Empire, and the Congress of Vienna.
- 29.511 History of Europe: 1815-1870 (3)** Reaction, revolution, and reform from Metternich to Bismarck; industrialization and scientific progress; emergence of nationalism, liberalism, and socialism. From romanticism and idealism to positivism and realism.
- 29.512 History of Europe: 1870 to 1914 (3)** Political, economic, and cultural effects of nationalism, imperialism, and industrialization in Europe. National developments and international alliances. Background of World War I.
- 29.513 Europe Since 1914 (3)** Political, social, and economic developments in Europe from the beginning of World War I through World War II.
- 29.514 Modern Revolutions (3)** Theory of revolutionary movements and the form and structure of revolution as exemplified in the Puritan, American, French, and Russian revolutions.
- 29.515 Expansion of Europe (3)** Overseas expansion of European countries from the 15th through the 19th centuries. Influence of colonial and imperialistic expansion in shaping recent history.
- 29.516 Economic History of Modern Europe I (3)** European economy from medieval times through the 18th century. Origins and growth of capitalism. Industrialism, colonialism; public credit and private finance; formation of national economies.
- 29.517 Economic History of Modern Europe II (3)** Economic aspects of European industrial, national, and colonial development since the 18th century.
- 29.519 Diplomatic History of Europe, 1815-1914 (3)** From the Congress of Vienna to the beginning of World War I. Special attention to emergence and effects of nationalism.
- 29.520 English Constitutional History (3)** Development of English political institutions, practices, ideas. Emphasis on evolution of representative traditions rather than on political narrative.
- 29.525 France: Second Empire to Fourth Republic (3)** Collapse of Second Empire. Formation of the Third Republic and its course to 1940. Vichy interlude and Fourth Republic.
- 29.528 Germany Since 1870 (3)** German history from the Bismarck era to the foundation of the German Federal Republic.
- 29.530 History of Czarist Russia (3)** Expansion of Russia from the Muscovite principality to the empire of the 20th century. Development of institutions and culture.
- 29.531 Russia Since 1917 (3)** Soviet Union from the October revolution to the Khrushchev era. Emphasis on internal political, socio-economic, and cultural developments.

- 29.532 History of East Central Europe (3)** East Central Europe (Finland, the Baltic States, Poland, Czechoslovakia, and Hungary) under Russian, Prussian and Austrian domination. The independent States in the Post World War I period.
- 29.533 History of the Balkans and Turkey (3)** Historical backgrounds. Period of Turkish domination. Rise of nationalism in the Balkans. Great Power diplomacy and the partition of Turkey. Recent developments.
- 29.610 Intellectual History of Europe Through the Enlightenment (3)** Ideas and outlooks that have influenced the development of western history from the 13th century to the eve of the French Revolution.
- 29.611 Intellectual History of Europe From the French Revolution (3)** Cultural and intellectual currents from the end of the 18th century. Rise of the romantic movement; impact of revolutionary ideas, science, and industrial technology.

UNITED STATES

- 29.540 Colonial Origins of the U.S. (3)** European backgrounds. Conflict of rival colonial systems. Political, economic, and social developments within the colonies. Causes and development of revolt.
- 29.541 Era of the American Revolution (3)** Survey of colonial backgrounds. Origins and developments of the American Revolution. Drafting and establishment of the Constitution of the U. S.
- 29.542 Development and Disruption of the Federal Union (3)** The U.S. from 1789 to 1861. Social and political implications of the Jeffersonian and Jacksonian reform movements of the period. Growth of sectionalism.
- 29.543 Civil War and Reconstruction (3)** Causes and course of the war; its impact on national life. Problems and effects of reconstruction. Industrialization and urbanization. Social and economic forces.
- 29.544 The U.S. in the 20th Century (3)** Era of Theodore Roosevelt. Emergence of the U. S. as a world power. The New Deal. The U. S. in two world wars.
- 29.545 The South in U.S. History (3)** Colonial times to the present. Factors making the South a distinctive part of the American nation.
- 29.546 The Frontier in U.S. History (3)** Westward expansion from colonial times to the close of the 19th century. Analysis of Turner's frontier hypothesis in the light of recent critical literature.
- 29.547 History of U.S. Foreign Policy (3)** Historical treatment and critical examination of the role of the U. S. in world affairs.
- 29.548 American Economic History I (3)** Review of American economic development from the colonial beginnings to the mid-19th century.
- 29.549 American Economic History II (3)** Review of American economic development during the past one hundred years.
- 29.550 History of Industry in the U.S. (3)** American industrial development from the end of the 18th century to the present. Structural and organizational aspects, location trends, technology, and distribution.



Hurst Hall

- 29.551 History of Agriculture in the U.S. (3)** Agrarian settlement and land policies; history and significance of farm implements and machinery; agricultural development by regions and commodities.
- 29.640 Intellectual History of the U.S. I (3)** Ideas and attitudes of the American people and their leaders from colonial times to the Civil War. Puritanism, the enlightenment, transcendentalism, democracy, and nationalism.
- 29.641 Intellectual History of the U.S. II (3)** Dominant patterns of American thought from the Civil War to the present. Impact of Darwinian evolution, industrialism, the vanishing frontier, progressive democracy, imperialism, and war.
- 29.642 Concept of American Nationalism (3)** Origin and development of nationalism with attention to manifest destiny, cultural nationalism, patriotism, and world-mindedness.
- 29.643 U.S. Expansion Abroad (3)** Political and economic expansion of the U.S. in key areas such as Latin America and the Pacific. Ideological impact of American civilization in all parts of the world.

LATIN AMERICA

- 29.570 Colonial Origins of Latin American Nations (3)** Colonization by Spain, Portugal, and France. Causes and developments of independence movements.
- 29.571 Growth of Latin American Nationalism (3)** History of Latin America from independence to the end of the 19th century. Constitutional, sociological, economic, and ideological aspects of national development.
- 29.572 Latin America in the 20th Century (3)** Movements of economic nationalism. Agrarian, electoral, and educational reform. Militarism. Cultural, ideological, and religious developments.

- 29.573 Latin American Social and Political Thought (3)** Spanish and Portuguese backgrounds. Ideas of the Independence leaders. Mid-century liberalism and romanticism. Positivist thought. Contemporary trends.

ASIA AND AFRICA

- 29.535 History of the Far East in Modern Times (3)** Historical backgrounds; invasion of western influence; conflict of national interests; economic and cultural systems; Asiatic consciousness and world organization.
- 29.536 History of Africa (3)** History of the African continent during the modern period. European colonization and competition; internal economic, social, and political developments; emerging African nationalism.
- 29.538 History of China Since the Ming Dynasty (3)** Political and social institutions; schools of thought; legal and moral concepts; literary, artistic and intellectual developments; elements of stability and change; international contacts to recent times.
- 29.539 History of Japan: 1600 to the Present (3)** Historical background; period of seclusion; restoration of a centralized monarchy; economic and political developments; establishment of an empire; World War II and post-war period.
- 29.561 History of the Middle East I (3)** History of the area from the Hegira to the fall of Constantinople.
- 29.562 History of the Middle East II (3)** History of the area from the fall of Constantinople to the present.
- 29.580 History of India I (3)** India up to the European conquests. Attention to Hinduism and Islam as religious and social forces, caste and family of traditional India, and village life.
- 29.581 History of India II (3)** Early European penetration and growth of British Indian Empire. 19th century social and intellectual developments. Growth of nationalism, to the present day. India's response to the Western impact.
- 29.585 Chinese Intellectual History (3)** Developments from ancient to modern times in science, technology, agriculture, historiography, language, literature, education, law, human relations, art. A comparative study utilizing sources in Western languages.

SEMINARS

- 29.710 Research Seminar in European History (3).**
- 29.730 Research Seminar in the History of the Far East (3).**
- 29.740 Research Seminar in the History of the U.S. (3).**
- 29.760 Research Seminar in the History of the Middle East (3).**
- 29.797 Master's Thesis Seminar (3-6).**
- 29.799 Doctoral Dissertation Seminar (3-6).**

SUMMER INSTITUTES

- 31.530 Institute of Genealogical Research (3).**

PSYCHOLOGY

Professors: ELLIS WEITZMAN (Chairman); JOHN E. BENTLEY (Emeritus); CHARLES K. TRUEBLOOD (Emeritus). *Associate Professors:* DAVID J. KING; FRED H. NOTHMAN. *Assistant Professors:* JANICE M. P. FISH; CALVIN F. NODINE; DAVID A. TUCKER. *Adjunct Professors:* IRWIN ALTMAN; ARDIE LUBIN; ERNEST S. PRIMOFF. *Professorial Lecturer:* WILLIAM HODOS.

DEGREE PROGRAMS

Undergraduate Degrees—Bachelor of Science; Bachelor of Arts

BACHELOR OF ARTS

University Requirements38-43 hours

Language Requirement 12 hours

Departmental Requirements:

Major Courses 27 hours

Including: 57.200, General Psychology (3); 57.302, Survey of Experimental Psychology (3); 57.400, Psychology of the Child (3), or 57.401, Psychology of the Adolescent (3); 21.320, Psychology of Education (3); 57.403, Historical Introduction to Modern Psychology (3); 57.404, Introduction to Social Psychology (3), or 57.524, Abnormal Psychology (3); 57.405, Psychological and Educational Measurements I (3); and six additional hours at the 300-500 level, selected in consultation with a department counselor.

Related Courses 12 hours

Advanced work selected from the following fields, with not more than nine hours in any one: anthropology, sociology, philosophy, economics, education, international relations, or mathematics. Courses must be at the 300-level or above, except 41.222 and 41.223 Differential and Integral Calculus I and II (8) which will be considered acceptable.

Tool Courses 3 hours

69.202, Basic Statistics (3). *Prerequisite:* College Algebra or equivalent.

Electivesto complete 126 hours

BACHELOR OF SCIENCE

University Requirements38-43 hours

Language Requirement 12 hours

Departmental Requirements:

Major Courses 32 hours

Including: 57.200, General Psychology (3); 57.300-301, Experimental Psychology I and II (8); 57.403, Historical Introduction to Modern Psychology (3); 57.405, Psychological and Educational Measurements I (3); 57.503, Psychology of the Cognitive Processes (3); 57.512, Motivation (3); 57.525, Physiological Psychology (3); and six additional hours of 400-500 level courses, selected in consultation with a department counselor.

Related Courses 12 hours

Advanced work selected from the following fields, with not more than nine hours in any one: mathematics, statistics, biology, chemistry or physics. Courses must be at the 300-level or above, except 41.222 and 41.223 Differential and Integral Calculus I and II (8) which will be considered acceptable.

Tool Courses 6 hours

69.202, Basic Statistics (3); 69.301 Psychological Statistics (3). *Prerequisite:* College Algebra or equivalent.

Electivesto complete 126 hours

Graduate Degrees—Master of Arts; Doctor of Philosophy

MASTER OF ARTS

Course Requirements: Minimum of 30 hours of approved graduate work, including 57.501 and 57.502, Advanced Experimental Psychology I and II (6); 57.540 and 57.541, History and Systems of Psychology I and II (6); 69.552, Advanced Psychological Statistics (3); and 6 hours of 57.698, Directed Research.

Written Comprehensive Examinations: Two, one in General Experimental Psychology and one in History and Systems of Psychology.

Other Requirements: Six hours of 57.698, Directed Research for M. A. candidates only.

MASTER OF ARTS (Counseling and Testing)

Course Requirements: Minimum of 30 hours of approved graduate work, including 57.505 Psychological and Educational Measurements II (3); 57.506 Psychological and Educational Measurements III (3); 57.510 Psychology of Personality (3); 57.512 Motivation (3); 57.524 Abnormal Psychology (3); 57.600 Experimental Approach to Clinical Psychology (3); and 6 hours of 57.691 Practicum Training.

Written Comprehensive Examination: One eight-hour examination in Counseling Psychology.

Other Requirements: Six hours of 57.691, Practicum Training.

DOCTOR OF PHILOSOPHY

Course Requirements: Minimum of 72 hours of approved graduate work, at least 36 (including dissertation credit) of which must be completed in residence at The American University, and six of which must be in 57.799 Doctoral Dissertation Seminar (3-6).

Written Comprehensive Examinations: Five, including one in General Experimental Psychology, one in History and Systems of Psychology, one in Social Psychology, and two in specialized fields.

Other Requirements: Proficiency examination in two research tools (language and statistics). Dissertation and oral defense of dissertation.

Graduate Comprehensive Examination Fields

Core Fields. 57.1 General Experimental Psychology, 57.2 Social Psychology: Psychological, 57.3 History and Systems of Psychology, 57.4 Counseling Psychology.

Specialized Fields. 57.10 Personality, 57.11 Measurement Techniques, 57.13 Developmental Psychology.

UNDERGRADUATE COURSES

- 57.200 General Psychology (3)** Introduction to the scientific study of behavior of organisms. *Prerequisite to other offerings of the department.*
- 57.300 Experimental Psychology I (4)** The experimental study of sensation and perception. *Prerequisite:* 69.202, Basic Statistics.
- 57.301 Experimental Psychology II (4)** The experimental study of learning, thinking, problem solving, and verbal behavior. *Prerequisite:* 57.300.
- 57.302 Survey of Experimental Psychology (3)** The experimental study of sensation, perception, and learning. Demonstrations. No laboratory. *Prerequisite:* 69.202, Basic Statistics.
- 57.307 Mental Hygiene (3)** The effects of learning, motivation, and biological characteristics on the reactional biography of the individual in society.
- 57.400 Psychology of the Child (3)** Growth through infancy and childhood, with emphasis on emotional behavior, intelligence, learning, social development.
- 57.401 Psychology of the Adolescent (3)** Physical, mental, social growth of the adolescent, with special consideration of the psychological bases of adolescent behavior.
- 57.403 Historical Introduction to Modern Psychology (3)** Historical background and development of present-day systematic points of view in psychology. *Prerequisite:* 57.300 or 57.302.
- 57.404 Introduction to Social Psychology (3)** Influence of group structure and dynamics on the behavior and development of the individual.
- 57.405 Psychological and Educational Measurements I (3)** Fundamental principles of testing and a critical survey of representative tests of achievement, intelligence, interest, aptitude and personality. *Prerequisites:* Six hours of Psychology and Basic Statistics.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

- 57.501 Advanced Experimental Psychology I (3)** Psychophysics, sensation and perception; their phenomena and theories in experimental psychology. *Prerequisite:* 57.301, Experimental Psychology II, and corequisite, 69.552, Advanced Psychological Statistics.
- 57.502 Advanced Experimental Psychology II (3)** Basic experimental facts and theories in the area of learning, cognition, and verbal behavior. *Prerequisite:* 57.501, Advanced Experimental Psychology I.
- 57.503 Psychology of the Cognitive Processes (3)** The experimental study of the psychological processes, and their inter-relationships, involved in verbal behavior, memory, problem solving and thinking. *Prerequisite:* 57.301, Experimental Psychology II.
- 57.504 Advanced Social Psychology (3)** Psychological factors in human social behavior. Social aspects of perception, motivation, thinking, language, attitudes, public opinion, persuasion, and prejudice. *Prerequisite:* 12 hours of psychology.

- 57.505 Psychological and Educational Measurements II (3)** Theory of mental tests: assessment and prediction. *Prerequisites:* 57.405, Psychological and Educational Measurements I or equivalent, graduate standing and permission of the instructor.
- 57.506 Psychological and Educational Measurements III (3)** An examination of representative individual tests of intelligence and laboratory practice in the administration, scoring, and interpretation of these tests. Laboratory fee, all students, \$5.00. *Prerequisites:* 69.202 and Psychological Measurements I or II.
- 57.510 Psychology of Personality (3)** Background of major personality theories; critical evaluation of personality theories and current research in this field. *Prerequisite:* permission.
- 57.512 Motivation (3)** Consideration and evaluation of current research and theory in motivation. Does not include personality theory. *Prerequisites:* 69.202 or equivalent and 57.301.
- 57.524 Abnormal Psychology (3)** A study of behavior pathology in the human organism. *Prerequisite:* 57.300 or 57.302.
- 57.525 Physiological Psychology (3)** A survey of the anatomical and physiological variables which affect sensation, perception, action, learning, and motivation.
- 57.526 Industrial Psychology (3)** Serving as an introduction to such technical problems as personnel selection, interviewing, morale, supervision, and management; human relations in industry; and the basic human factors involved in the design and operation of man-machine systems. *Prerequisite:* 69.202.
- 57.532 Social and Psychological Aspects of Intergroup Tensions (3)** The psychological nature of intergroup prejudices, and its relation to other aspects of personality and behavior. Recent research on the determinants of intergroup attitudes. Techniques for the reduction of intergroup tension.
- 57.540 History and Systems of Psychology I (3)** Philosophical and scientific background of modern psychology and contemporary problems in theory construction. *Prerequisite:* One year of Experimental Psychology or permission.
- 57.541 History and Systems of Psychology II (3)** Continuation of 57.540.
- 57.572 Principles and Practices of Guidance (3)** Principles and methods of counseling. Basic course for teachers and school administrators; beginning course for counselors. *Prerequisite:* 15 hours of psychology, including Motivation or Personality.
- 57.600 Experimental Approach to Clinical Psychology (3)** The study of behavior characteristics of the individual through methods of clinical measurement, observation, and psychotherapy. A study of research in the area. *Prerequisite:* permission of instructor.
- 57.670 Techniques of Counseling (3)** Techniques of vocational, educational and personal problem counseling. *If not a graduate student in psychology, permission of instructor required.*
- 57.691 Practicum Training (3-6)** Practice, under qualified supervision, in technical procedures related to testing and counseling.

- 57.698 Directed Research (6) For M. A. candidates only.
- 57.798 Seminar in Psychology: May be repeated for credit. *Prerequisite:* Written permission of a full-time member of the department.
- I. Current Research in Social Psychology (6).
 - II. Psychometric Methods (6).
 - III. Current Research in Learning (6).
 - IV. The Cognitive Processes (6).
 - V. Current Researches in Sensation and Perception (6).
 - VI. Motivation and the Affective Processes (6).
- 57.799 Doctoral Dissertation Seminar (3-6).



SOCIOLOGY AND ANTHROPOLOGY

Professors: FRANK LORIMER; HARVEY C. MOORE; JOHN C. SCOTT; AUSTIN VAN DER SLICE (Chairman). *Associate Professor:* S. FREDERICK SEYMOUR. *Assistant Professors:* HOWARD S. GALL; LEROY S. GRAHAM; WILLIAM M. HARRISON; JOAN RUBIN. *Adjunct Professors:* ROBERT T. BOWER; EWAN CLAGUE; HELEN MARTZ; OSCAR WEIGERT. *Professorial Lecturers:* VLADIMIR V. DE SMITT; VICTOR EVJEN; JAMES H. FOX; ISAAC FRANCK; HOWARD B. GILL; CLIFTON R. JONES; EILEEN P. KUHN; WILLIAM H. LEWIS; BELA C. MADAY; ANGEL PALERM; MORRIS ROSENBERG; JOHN G. THEBAN; CLARK TIBBITTS; IVOR WAYNE; ELIJAH L. WHITE. *Lecturers:* WILLIAM H. CROCKER; PHILIP E. ENTERLINE; EARL E. HUYCK; DENIS F. JOHNSTON; RUTH H. LANDMAN; JAMES A. MCCAFFERTY; BENJAMIN B. POWELL.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements 38-43 hours

Students majoring in anthropology or sociology should complete 65.200 Introduction to Sociology, 65.201 Introduction to Anthropology, 57.200 General Psychology, 9.110 General Zoology, and 9.111 General Botany, as part of their University requirements.

Language Requirement 12 hours

Departmental Requirements:

Major Courses (300-level or above) 24 hours

ANTHROPOLOGY

Courses must include at least one from each of the fields listed below and at least two from culture area analysis:

Ethnology, Social Anthropology, Theoretical Anthropology courses: 65.430 Primitive Religions, 65.431 Primitive Political Systems, 65.530 Theory and Methods of Cultural Anthropology, 65.531 Comparative Social Organization, 65.532 Processes of Culture, 65.534 Cultural Analysis, 65.535 Cultural Influences Upon the Individual, 65.536 History of Anthropology, 65.538 Applied Anthropology.

Culture Area Analysis courses: 65.335 The North American Indian, and at least one other culture area to be chosen from the several courses offered under 65.539 Culture Area Analysis (presently on Africa, Middle America, South America, Southeast Asia) or other area course approved by the department.

Linguistics courses: 37.300 Introduction to Language (required), 37.500 Principles of Linguistics, 37.501 Linguistic Structure I, 37.502 Linguistic Structure II, 37.505 History of Linguistics, 65.537 Language and Culture.

Archaeology and Physical Anthropology courses: 65.331 Physical Anthropology, 65.332 Introduction to Archaeology, 65.520 Archaeology of North America, 65.521 Archaeology of Nuclear America, 65.522 The Beginnings of Civilization in the Near East, 65.523 Paleolithic Archaeology of the Old World.

SOCIOLOGY

Courses must include: 65.410 Sociological Theory or 65.510 Concepts of Sociology; 65.420-421 Introduction to Social Research I and II; 65.511 Theory of Social Research; at least one course in the field of Social Organization (65.340, 65.345, 65.540, 65.542, 65.543, 65.545, 65.547, 65.548, 65.549, 65.550, 65.580); and at least one course in the area of Population and Ecology (65.352, 65.450, 65.551, 65.554), Social Psychology (65.591, 65.592, 65.593, 65.615), or Social Change and Disorganization (65.361, 65.563, 65.568, 65.569, 65.570).

Related Courses (300-level or above) 18 hours

ANTHROPOLOGY

Six hours of Sociology (must include 65.420 and 65.421, or for students taking 69.202, 65.511 and another advanced sociology course; other sociology courses recommended are 65.340, 65.345, 65.352, 65.450). Twelve hours chosen in consultation with departmental adviser from the social and natural sciences.

SOCIOLOGY

Six hours of Anthropology; twelve hours in a related field chosen in consultation with departmental adviser.

Tool courses (for Sociology majors) 3 hours
69.202 Basic Statistics, or proficiency examination in statistics.

Electivesto complete 126 hours

Graduate Degrees—Master of Arts; Doctor of Philosophy

MASTER OF ARTS IN ANTHROPOLOGY

Course Requirements: Minimum of 30 hours of approved graduate work, including 65.797 Master's Thesis Seminar (3-6).

Written Comprehensive Examinations: Three, including one in the general history of anthropological theory and method; two in specialized fields of anthropology such as ethnology and social anthropology, ethnography, linguistics, the archaeology of two selected areas of the Old World or New World, physical anthropology; or one specialized field in anthropology and one related field.

Other Requirements: Thesis and oral defense of thesis.

MASTER OF ARTS IN SOCIOLOGY

Course Requirements: Minimum of 30 hours of approved graduate work, including 65.510 Concepts of Sociology, 65.511 Theory of Social Research, 65.610-611 History of Sociological Theory I and II, 65.612-613 Social Research Methods I and II, and 65.797 Master's Thesis Seminar (3-6).

Written Comprehensive Examinations: Three, including one in sociological theory, one in methods of social research, and one specialized field in sociology or anthropology.

Other Requirements: At least one course above the introductory level in statistics or a departmental proficiency examination in statistics. Thesis and oral defense of thesis.

DOCTOR OF PHILOSOPHY IN SOCIOLOGY

Course Requirements: Minimum of 72 hours of approved graduate work, at least 36 (including dissertation credit) of which must be in residence at The American University, and six of which must be in 65.799 Doctoral Dissertation Seminar (3-6).

Written Comprehensive Examinations: Five, including one in sociological theory, one in methods of social research, one in social organization, and two selected from ethnic group relations, population, criminology, public opinion, communication research, social psychology, or from a related field outside of sociology.

Other Requirements: Proficiency examination in two tools of research (German or French, and statistics). Dissertation and oral defense of dissertation.

Graduate Comprehensive Examination Fields

ANTHROPOLOGY

Core Field. 65.6 History of Anthropological Method and Theory.

Specialized Fields. 65.16 Ethnology and Social Anthropology, 65.17 Ethnography (a specified area), 65.18 Linguistics, 65.19 Archaeology (Old World Prehistory), 65.20 Archaeology (New World), 65.21 Physical Anthropology, 65.22 Cultural Area Analysis (with emphasis on specified area) (M. A. only), 65.23 Language and Culture Analysis (M. A. only).

SOCIOLOGY

Core Fields. 65.1 Sociological Theory, 65.2 Methods of Social Research, 65.10 Social Organization (for the Ph.D.).

Specialized Fields. 65.10 Social Organization (for the M.A.), 65.11 Ethnic Group Relations, 65.12 Population, 65.13 Criminology, 65.14 Public Opinion, 65.15 Communication Research, 65.24 Social Psychology: Sociological.

UNDERGRADUATE COURSES

- 65.200 Introduction to Sociology (3)** Fundamental characteristics of social relationships. Culture, personality, population and ecology, social institutions and processes, cultural change.
- 65.201 Introduction to Anthropology (3)** Introduction to the development of man and his culture; the comparative study of society and culture; the contribution of anthropology to the understanding of modern life.
- 65.221 Marriage and Family Living (3)** Marriage goals, husband-wife relations, pregnancy, attitudes towards children, use of money, working wives and mothers, older members of the family.
- 65.331 Physical Anthropology (3)** Man's place in nature. Man as a primate, the fossil record and human evolution. Modern races from a genetic, structural, and functional point of view. Pertinent cultural factors.
- 65.332 Introduction to Archaeology (3)** Basic concepts and methodology utilized by archaeologists in reconstructing the prehistoric cultural processes of man; a broad survey of the major chronological developments of the Old and New Worlds.

- 65.335 The North American Indian (3)** Survey of the Indians of America north of Mexico; origins, languages, modes of life, history. Results of European conquest. *Prerequisite:* 65.201.
- 65.340 The Family (3)** Varying forms and functions of family organization in different societies. Evolution of American family patterns. Family relations and personality formation. Contemporary social changes influencing family life. *Prerequisite:* 65.200.
- 65.345 American Society (3)** An analysis of contemporary American social institutions. The American social system in historical perspective, value systems, ethnic composition, formal and informal structures. *Prerequisite:* 65.200.
- 65.346 Comparative Social Systems (3)** A comparative analysis of contemporary societies, social institutions, value systems, formal and informal organization, integration and cohesiveness, relationships with other societies. *Prerequisite:* 65.200.
- 65.352 Human Ecology (3)** Relation of environment to distribution of population and to social structure and culture. *Prerequisite:* 65.200 or 65.201.
- 65.361 Social Disorganization (3)** Analysis of social problems created by technical and cultural change. Effect of migration on community structure. Social background of personal maladjustment. Processes of social reorganization. *Prerequisite:* 65.200.
- 65.365 Introduction to Social Work (3)** Development of social welfare philosophy and practices. The areas of social work, group work, and community organization for public welfare. Community resources. Visits to selected agencies.
- 65.410 Sociological Theory (3)** Historical background of the theories, concepts, and methods of sociology; emergence and characteristics of the most significant sociological systems. *Prerequisite:* 65.200.
- 65.415 Law and the Social Order (3)** Functions of law in society; social origins and development of political authority around human rights. The changing role of law in the modern democratic state.
- 65.420 Introduction to Social Research I (3)** Introduction to the nature, methods, principles, and techniques of scientific social research. Critical review of types of investigations, with accent on field research and the statistical method. *Prerequisite:* 65.200.
- 65.421 Introduction to Social Research II (3)** A continuation of Introduction to Social Research I. *Prerequisite:* 65.420.
- 65.430 Primitive Religions (3)** Varieties of religious experiences and expressions, exclusive of the great world religions. Role of religion in influencing behavior and in integrating particular societies, cultures. *Prerequisite:* 65.201.
- 65.431 Primitive Political Systems (3)** Study of control and authority in a variety of primitive peoples, with emphasis on the more complex primitive societies. *Prerequisite:* 65.201.
- 65.450 Population (3)** Survey of world population trends. Introduction to methods of analysis. Determinants and consequences of variations in fertility, mortality, and migration. *Prerequisite:* 65.200.





ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

SOCIOLOGICAL THEORY

- 65.510 Concepts of Sociology (3)** Systematic survey, critical analysis of sociological concepts. Emphasis on theoretical systems. *Prerequisite:* 12 hours of sociology.
- 65.610 History of Sociological Theory I (3)** Comparative study of major schools of sociological theory in France, Great Britain, the United States. *Prerequisite:* permission of the instructor.
- 65.611 History of Sociological Theory II (3)** Comparative study of major schools of sociological theory in Germany, Austria, Italy. *Prerequisite:* permission of the instructor.
- 65.711 Sociological Theory: Seminar (3)** Intensive study of selected area or school of sociological thought. Emphasis on research in source materials. *Prerequisite:* permission of the instructor.

SOCIAL RESEARCH

- 65.511 Theory of Social Research (3)** Critical analysis of the logical and methodological problems of social investigation. The theoretical orientation of logically distinct approaches to sociological research. *Prerequisite:* 12 hours of sociology.
- 65.612 Social Research Methods I (3)** Research procedures in sociology with emphasis on survey design, collection of quantitative data. *Prerequisites:* 69.202 and permission of the instructor.
- 65.613 Social Research Methods II (3)** Research procedures in sociology with emphasis on analysis of quantitative data. *Prerequisite:* 65.612.
- 65.615 Attitude Measurement and Research (3)** Examination of various means of measuring attitudes and analyzing survey data. Actual empirical field work in opinion and attitude research studied. Emphasis on research methods. *Prerequisite:* 65.612.
- 65.691 In-Service Training Project (3-6)** Research project for qualified students working in government or private organization in areas related to their degree program. Project under supervision of faculty and organization concerned. *Prerequisite:* permission of Department Chairman.
- 65.712 Seminar in Sociology (3)** Preparation and critical discussion of research papers on substantive and theoretical problems in sociology. May be repeated for credit. *Prerequisite:* permission of the instructor.

ANTHROPOLOGY

- 65.520 Archaeology of North America (3)** Prehistory of the native cultures north of Mexico from the first peopling of the continent to the period of white settlement. *Prerequisite:* 65.332.
- 65.521 Archaeology of Nuclear America (3)** A developmental and comparative survey of the rise of the middle American and Andean civilizations from the hunting-fishing stage to that of empire. *Prerequisite:* 65.332.

- 65.522 The Beginnings of Civilization in the Near East (3)** Archaeology of the Ancient Near East from the Nile to the Indus, and the origins and development of civilization in the Neolithic and early metal-using periods. *Prerequisite:* 65.332.
- 65.523 Paleolithic Archaeology of the Old World (3)** Archaeological methods and techniques as applied to the Paleolithic cultures of Europe, Asia and Africa, including the material culture and associated physical types. *Prerequisite:* 65.332.
- 65.530 Theory and Methods of Cultural Anthropology (3)** Anthropological theories of culture and society; their history, present status, influences. Methods pertinent to the theories. *Prerequisite:* 65.201.
- 65.531 Comparative Social Organization (3)** Anthropological approach to the comparative study of selected societies and varieties of social structure. *Prerequisite:* 65.201.
- 65.532 Processes of Culture (3)** Dynamics of culture. Growth, development, stability in culture content, form, organization. Acculturation and nativistic movements. Assimilation and integration of ethnic groups. *Prerequisite:* 65.201.
- 65.534 Cultural Analysis (3)** An anthropological approach to an understanding of problems of cross-cultural relations and of individual adjustments to and appreciation of societies with different cultures.
- 65.535 Cultural Influences Upon the Individual (3)** Examination of anthropological studies concerning personality. Influences of culture upon the thoughts and actions of the individual and the resulting cultural patterns and configurations. *Prerequisite:* 65.201.
- 65.536 History of Anthropology (3)** Development of systematic theory, techniques and methods, and anthropological exploration in ethnology, archaeology, physical anthropology and linguistics. *Prerequisite:* 65.201.
- 65.537 Language and Culture (3)** Cross-cultural consideration of language structure and behavior in relation to the rest of culture and to problems of culture pattern and change. *Prerequisite:* 65.201.
- 65.538 Applied Anthropology (3)** Applications of concepts, approaches in anthropology to selected problems in government administration, industry, medicine and public health, technical assistance programs. *Prerequisite:* 65.201.
- 65.539 Culture Area Analysis (3)** A selected culture area will be analyzed in terms of process, function, structure and development. May be repeated for credit if different areas are selected. *Prerequisite:* 65.201.

SOCIAL ORGANIZATION

- 65.540 Social Organization (3)** The social structure emphasizing the nature, functioning, integration of social institutions; types of organizations; family, clique, voluntary association, work, bureaucracy, community; social differentiation and stratification. *Prerequisite:* 65.200.
- 65.542 Sociology of Political Action (3)** Critical evaluation of recent theories of political sociology. Motivation in political behavior. Application of concepts of group participation from functional sociology and psychology. *Prerequisites:* 65.200 and 53.200, American Government: National.

- 65.543 Sociology of Work (3)** A sociological analysis of occupations and the working place. Labor force demography, concepts and basic methodological approaches, relation to the broader areas of social organization. *Prerequisite:* 65.200.
- 65.545 Contemporary Communities (3)** Analysis and comparison of the social and political structures and ideologies of contemporary communities of the world, stressing American community types. Approaches to community research. *Prerequisite:* 65.200.
- 65.547 Social Stratification (3)** Class, status and power relations in society. Caste, estate, social class, social mobility. Theories and empirical research findings of current importance. *Prerequisite:* 65.200.
- 65.548 Race and Culture Contacts (3)** Analysis of problems and processes deriving from contacts of peoples different as to race and/or culture. Prejudice, discrimination, conflict, accommodation, acculturation, amalgamation, assimilation. *Prerequisite:* 65.200.
- 65.549 Sociology of Science (3)** Science as major institution in modern society; historical development, social organization, inter-relationships; social, cultural determinants of scientific activities; contributions from sociology of knowledge, invention, technology. *Prerequisite:* 65.200.
- 65.550 The City (3)** Patterns and process of urban society. The ecological and social organization of the modern city. Urban problems and trends. Emphasis on methods of research in the field. *Prerequisite:* 65.200.
- 65.580 Religious Movements and Institutions (3)** Concepts, methods and techniques in the sociological analysis of religion. Historical, comparative and functional approaches to religion. Emphasis on European and American Christianity.

POPULATION AND ECOLOGY

- 65.551 Analysis of Population Trends (3)** Measurement and analysis in demography with substantive treatment of population trends. Stable population theory; factors affecting fertility and mortality; population projection; distribution and community structure. *Prerequisite:* 65.200.
- 65.554 Morbidity and Mortality Analysis (3)** Various concepts of a population; increment and decrement functions, measurement of morbidity, life table functions, survivorship function as research tool, biological aspects of life tables. *Prerequisite:* 69.202.
- 65.751 Seminar in Population Studies (3)** Experimental investigations of selected problems, with related discussion of theory and methodology. *Prerequisite:* permission of the instructor.

SOCIAL PSYCHOLOGY

- 65.591 Person and Society (3)** Ways in which the individual becomes a person with tendencies to play various roles in different situations. Social control through interpersonal relations and self-conception. *Prerequisite:* 65.200.
- 65.592 Social Aspects of Mass Communication (3)** Communication of ideas in modern society. Special attention to current empirical research on mass media in relation to sociological theory. *Prerequisite:* 65.200.

65.593 Collective Behavior (3) Analysis of crowd, mass, public behavior. Relationship to social movements of modern times. Role of leadership in various types of collective behavior. Factors, processes in emergence of social order. *Prerequisite:* 65.200.

65.615 Attitude Measurement and Research (3) (see under Social Research)

SOCIAL CHANGE AND DISORGANIZATION

65.561 Public Welfare: Principles and Problems (3) Principles underlying public welfare programs and major problems in the field. Organizational structure, methods of operation of federal, state, local agencies administering programs. *Prerequisite:* 65.200.

65.562 Sociology of Health (3) Health problems in their social and economic aspects. Sociological methodologies and findings in the area of health and medical care. *Prerequisite:* 65.200.

65.563 Causes of Crime (3) Nature, causal factors in delinquent behavior. Natural history of delinquent careers. Programs and policies for controlling problems of delinquency and crime in urban areas. *Prerequisite:* 65.200.

65.566 Aging in Modern Life (3) Social, economic, health problems related to the aging process. Changing social roles, attitudes. Provision for the economic, health, psychological, social needs of the older person.

65.567 Urban Redevelopment (3) Theory and practice of urban redevelopment. Causal factors of city blight and slums; efforts of public, private agencies. Planning, financial, social legislative aspects of urban redevelopment. *Prerequisite:* 65.200.

65.568 Treatment of the Offender I (3) A critical examination of the theory, practices and problems in the fields of probation and parole of adult offenders. *Prerequisite:* 65.563.

65.569 Treatment of the Offender II (3) A critical examination of the theory, practices and problems in the institutional treatment of adult offenders. *Prerequisite:* 65.563.

65.570 Social-Psychological Aspects of Intergroup Tensions (3) The social-psychological nature of intergroup prejudice, and its relation to other aspects of personality and social behavior. Recent research on the determinants of intergroup attitudes. Techniques for the reduction of intergroup tension. *Prerequisite:* 65.200.

65.713 Seminar in Family and Marriage Relations (3) Intensive study of selected problems in the area of family and marriage relations. Student reports and critical appraisals by the seminar. *Prerequisite:* permission of the instructor.

65.797 Master's Thesis Seminar (3-6).

65.799 Doctoral Dissertation Seminar (3-6).

POLITICAL SCIENCE

LAWRENCE W. WADSWORTH, JR., Coordinator

A major in political science is offered in the College of Arts and Sciences. The student matriculates and is advised in the College but takes most of his major courses in the School of Government and Public Administration and the School of International Service. Requirements for the political science major are as follows:

University Requirements 38-43 hours

Language Requirement 12 hours

Major Requirements 36 hours

Core Courses: 53.200 American Government: National, 53.201 American Government: State and Local, 33.200 Introduction to World Politics, 53.370 Comparative Government, 33.302 Foreign Policy of the Great Powers, 53.520 Early Political Theory, 53.521 Modern Political Theory, 33.432 International Law and Organization.

Primary Specialization: Twelve additional credit hours of advanced courses in one or the other of government or international relations.

If primary specialization is in government, courses must be from the following areas: Government Processes, Public Law, Political Dynamics, or Comparative Government and Politics.

If primary specialization is in international relations, up to six credit hours may be taken in area surveys.

Related Studies 12 hours

Twelve credit hours in related courses taken in consultation with adviser.

Electives to complete 126 hours

Students interested in this specialization apply for admission to the major in the Office of the Dean, 300 Asbury Building, where they may seek counsel at any time in connection with their academic problems. A Political Science counseling station is maintained at the College Registration Center during each registration period.

The attention of students also is called to undergraduate programs in the School of Government and Public Administration, where degrees may be earned in the fields of Government and Public Administration. The College works in close cooperation with the faculty of this School and is desirous that students understand the educational options provided through it.

DIVISION OF FINE AND COMMUNICATIVE ARTS



**FINE AND APPLIED ARTS
JOURNALISM
PUBLIC RELATIONS
MUSIC
SPEECH ARTS
DRAMA
RADIO-TV
SPEECH**

FINE AND APPLIED ARTS

Professors: ANDREW S. KECK; BEN L. SUMMERFORD (Chairman). *Associate Professors:* SARAH M. BAKER; ROBERT F. GATES. *Assistant Professors:* LOTHAR BRABANSKI; IRENE W. ENO; HELENE M. HERZBRUN. *Instructors:* ROBERT D'ARISTA; WILLIAM B. OLDAKER. *Adjunct Professors:* MARGARET BOUTON; JAMES F. CAHILL; WILLIAM CALFEE; LYNN EGBERT; STEPHEN KRAFT; HUBERT LECKIE. *Professorial Lecturers:* LUCILE FIREY; GERTRUD HOLLOWAY; ROBERT B. SHAFFER; PRENTISS TAYLOR. *Lecturers:* DOROTHY L. DAY; ROLAND HOOVER; LUCIANO PENA Y LILLO.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements	38-43 hours
Language Requirement	12 hours

Departmental Requirements:

Major Courses	34-42 hours
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Students majoring in painting or sculpture complete 30 hours of studio courses and 12 hours of art history (including 7.100 and 7.101 Survey of Art I and II). Students preparing to teach art complete 24 hours of studio courses; 6 hours in 5.370 and 5.371 Methods of Teaching Art I and II; and 12 hours in art history. Students majoring in art history complete 30 hours in art history (including 7.100 and 7.101 Survey of Art I and II); and 4 hours in painting, sculpture or drawing. Students majoring in design complete 24 hours in design; 12 hours in studio art courses; and 6 hours in art history. Students majoring in interior design complete 21 hours in interior design; 6 hours in 5.350 and 5.351 Design Fundamentals I and II; 9 hours in studio courses; and 6 hours in art history.

Related courses	12-27 hours
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Students majoring in fine and applied arts are advised to take courses at the 300-level or above in the humanities or the social sciences. Students planning to teach art in secondary schools select in consultation with the Department of Education 15 hours of courses in education. Students majoring in design or interior design are advised to take courses in business administration, psychology, journalism, public relations, and the humanities.

Electives	to complete 126 hours
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Graduate Degree—Master of Arts

Course Requirements: Minimum of 30 hours of approved graduate work, including 5.797 Master's Thesis Seminar (3-6). Of the remaining 24-27 hours, 12-15 hours should be selected from 5.520 and 5.521 Techniques of Etching I and II, 5.533 Materials and Techniques of Painting, 5.560 and 5.561 Drawing I and II, 5.792 Art Laboratory—Painting, 5.793 Art Laboratory—Sculpture; and 12 hours should be selected from art history, humanities, or social sciences.

Written Comprehensive Examinations: Three, including one in theory and techniques of painting or sculpture, one in art history, and one specialized field from art history, humanities or social sciences.

Thesis: Execution of an original work or works of art defended by written critical analysis of problem undertaken.

Graduate Comprehensive Examination Fields

Core Fields: 5.1 Theory and Techniques of Painting, 5.2 Theory and Techniques of Sculpture.

Specialized Fields: 5.9 Medieval Art, 5.10 Renaissance Art, 5.11 Modern Art, 5.13 Painting in the United States, 5.14 Criticism of Painting, 5.15 Sculpture, 5.16 Painting, 5.17 Art Education.

UNDERGRADUATE COURSES

- 5.104 Introduction to Visual Arts (3)** Develops visual perception and presents philosophical and theoretical background necessary for an informed and sensitive appreciation of painting, sculpture, architecture and the decorative arts. Lectures and visual material.
- 5.130 Oil Painting I (1)** Basic problems of figure and still life painting. Emphasis on color and design. Primarily for amateurs and students other than art majors. May be repeated for credit. Fee, all students, \$5.
- 5.131 Oil Painting II (1)** Continuation of 5.130. Fee, all students, \$5.
- 5.160 Sketch Class I (1)** Life drawing with emphasis on rapid sketch. May be repeated for credit. Fee, all students, \$5.
- 5.161 Sketch Class II (1)** Continuation of 5.160. Fee, all students, \$5.
- 5.320 Creative Painting I (2-3)** Fundamentals of painting. Comprehensive consideration of color, composition and drawing from still life and figure and in individually assigned projects. May be repeated for credit. Student registers in elementary section in first year, intermediate section second year and advanced section in third and fourth years. Fee, all students, \$5 per credit hour.
- 5.321 Creative Painting II (2-3)** Continuation of 5.320. Fee, all students, \$5 per credit hour.
- 5.340 Sculpture I (2-3)** Problems and principles of sculpture. Acquaintanceship with tools, techniques, materials for plastic expression. May be repeated for credit. Fee, all students, \$5 per credit hour.
- 5.341 Sculpture II (2-3)** Continuation of 5.340. Fee, all students, \$5 per credit hour.
- 5.360 Drawing I (3)** Structural drawing from the human figure and head. Anatomy, movement, expression. Course covers range of techniques and mediums. May be repeated for credit. Fee, all students, \$15.
- 5.361 Drawing II (3)** Continuation of 5.360. Fee, all students, \$15.

DESIGN

- 5.350 Design Fundamentals I (3)** Theory and techniques of design, applicable to all problems of visual presentation; layout, display, graphics, etc. *Prerequisite:* elementary proficiency in drawing.

- 5.351 Design Fundamentals II (3)** Continuation of 5.350. *Prerequisite:* 5.350.
- 5.352 Lettering and Typography I (3)** Theory and analysis of letter forms including practice and execution. Study of type faces, their arrangement and setting.
- 5.353 Lettering and Typography II (3)** Continuation of 5.352; particular application to advertising design. *Prerequisite:* 5.352.
- 5.354 Creative Photography I (3)** Introduction to the problems of the camera and its use as a creative medium in the field of two-dimensional design. Laboratory and lecture.
- 5.355 Creative Photography II (3)** Continuation of 5.354. *Prerequisite:* 5.354.
- 5.356 Advanced Design I (3)** Experimentation and practice in design problems relating to visual communication; emphasis on techniques and solutions of professional problems. *Prerequisite:* 5.351 or equivalent.
- 5.357 Advanced Design II (3)** Continuation of 5.356. *Prerequisite:* 5.356 or permission of instructor.
- 5.358 Interior Design I (3)** Basic principles, approached through design fundamentals and the history of the decorative arts in the major style periods. Illustrated lecture.
- 5.359 Interior Design II (3)** Study of the primary purposes of and techniques used in interior planning through the practical application of design principles to elementary decorative problems. Studio problems and lecture. *Prerequisite:* elementary proficiency in drawing.



- 5.368 Interior Design III (3)** Planning of complete residential interiors, coordinating function and design with the physical requirements of structure and the personality needs of the occupants. Studio problems. *Prerequisite:* 6 hours in interior design or permission of instructor.
- 5.369 Interior Design IV (3)** Study and analyses of style elements, harmonies and values as expressed in various periods and developments in the history of the decorative arts. Studio problems. *Prerequisite:* 5.368.
- 5.378 Interior Design V (3)** Advanced study in development of plans for the interiors of public buildings with emphasis on total design integration. Studio problems. *Prerequisite:* 5.369.
- 5.379 Interior Design VI (3)** Advanced study in personal expression and professional capability in development and presentation of interior design plans. Studio problems. *Prerequisite:* 5.378.
- 5.383 Textile Design (3)** Theory and practice of principles of design as applied in decoration of flat surfaces. Trade specifications. Research and history of textile design.
- 5.388 Interior Design VII (3)** Professional and business principles, practices, and procedures of the interior designer. Studio problems. *Prerequisite:* 5.368.
- 5.389 Interior Design VIII (3)** Accessories, fabrics and materials as elements of interior design approached through a review of their historical development, their forms, and their use. Illustrated lecture. *Prerequisite:* 5.358.

ART EDUCATION

- 5.370 Methods of Teaching Art I (3)** Crafts used in teaching, e.g., simple pottery, silk screen, linoleum block, fabric design, etc., as well as theory of teaching art on secondary school level. Fee, all students, \$10. *Prerequisite:* 12 credit hours of studio classes or permission of instructor.
- 5.371 Methods of Teaching Art II (3)** Continuation of 5.370. Fee, all students, \$10. *Prerequisite:* 5.370.
- 5.380 Teaching Art in Elementary Schools (3)** Methods and techniques of teaching art as part of regular elementary school instruction. Fee, all students, \$10.

ART HISTORY

- 7.100 Survey of Art I: Ancient and Medieval (3)** Illustrated historical introduction to architecture, sculpture and painting with art presented as an objectification and record of man's major beliefs and ideas. Field trips in Washington.
- 7.101 Survey of Art II: Renaissance and Modern (3)** Illustrated historical introduction to architecture, sculpture and painting in Western world between 1500 and 1950. Attention to selected original works in Washington.
- 7.300 Ancient Art (3)** Ancient Mediterranean civilizations studied through the language of the visual arts with emphasis on the cultural achievements of classical Greece.
- 7.304 Renaissance Architecture (3)** Renaissance, Mannerist and Baroque architecture in Italy and spread of styles to North Europe from 1750.

- 7.305 Modern Architecture (3)** Development of architecture in Europe and the United States from 1700 to present.
- 7.310 Art in the United States I (3)** Survey of painting, sculpture and architecture from earliest Colonial days to 1870, viewed against their European backgrounds.
- 7.311 Art in the United States II (3)** Evaluation of major art forms (painting, sculpture, architecture) in United States from Civil War to present, emphasizing growth of independent style.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

STUDIO

- 5.520 Techniques of Etching I (3)** A course in engraving, etching and aquatint, designed to give the advanced student a thorough knowledge of traditional and modern methods in intaglio printing. Fee, all students, \$15. *Prerequisite:* 12 credit hours in drawing or permission of instructor.
- 5.521 Techniques of Etching II (3)** Continuation of 5.520. Fee, all students, \$15. *Prerequisite:* 5.520.
- 5.533 Materials and Techniques of Painting (3)** Technical investigation of painting methods from Renaissance to present. Preparation of grounds, media, under-painting, glazing, emulsions for tempera, etc.
- 5.560 Drawing I (3)** Experiments in the creative emotional quality of drawing. Development of a personal creative expression. Fee, all students, \$15. *Prerequisite:* 12 credit hours of undergraduate drawing.
- 5.561 Drawing II (3)** Continuation of 5.560. Fee, all students, \$15. *Prerequisite:* 5.560 or 12 credit hours of undergraduate drawing.
- 5.792 Art Laboratory—Painting (3-6)** Intensive investigation of ideas and techniques in painting. Emphasis on experimentation, leading to development of individual style. Fee, all students, \$5 per credit hour. *Prerequisite:* 24 credit hours of painting or equivalent.
- 5.793 Art Laboratory—Sculpture (3-6)** Intensive investigation of sculpture with emphasis on experimentation leading to development of individual style. Fee, all students, \$5 per credit hour. *Prerequisite:* 24 credit hours of sculpture or equivalent.
- 5.797 Master's Thesis Seminar (3-6).**

ART HISTORY

- 7.500 Renaissance Painting (3)** Major works of Renaissance, Mannerist, and Baroque painters and of El Greco and Velasquez with due attention to original works in National Gallery. *Prerequisite:* 6 credit hours of art history including 7.101 or equivalent.
- 7.501 Modern Painting (3)** Major works of European painters from 1700 to 1950 (Watteau to Matisse-Picasso). *Prerequisite:* 6 credit hours of undergraduate art history including 7.101 or equivalent.

- 7.502 Mediterranean Medieval Art (3)** Early Christian in Italy; Byzantine in the Near East; Romanesque and Gothic in Italy (Duccio, Giotto). *Prerequisite:* 6 credit hours of undergraduate art history including 7.100 or equivalent.
- 7.503 North European Medieval Art (3)** Art from the early Christian period through Romanesque and Gothic to 1400 (manuscript illuminations and French cathedrals: sculpture, stained glass.) *Prerequisite:* 6 credit hours of undergraduate art history including 7.100 or equivalent.
- 7.504 Northern European Painting from 15th to 17th Century (3)** Visual arts of North Europe from 1400 to 1700 with stress on painting (Van Eyck, Bosch, Breughel, Rubens, Rembrandt, Poussin). *Prerequisite:* 6 credit hours of undergraduate art history including 7.101 or equivalent.
- 7.506 Renaissance Sculpture (3)** Italian sculpture from 1400 to 1700 with stress on achievements of Donatello, Michelangelo, Bernini. *Prerequisite:* 6 credit hours of undergraduate art history including 7.101 or equivalent.
- 7.507 Modern Sculpture (3)** Changes in sculpture from 1700 to the present with stress on innovations of Rodin, Brancusi, Moore and the American abstractionists. *Prerequisite:* 6 credit hours of undergraduate art history including 7.101 or equivalent.
- 7.508 Oriental Art I: Japanese and Southeast Asia (3)** Arts and culture of the Far East with emphasis on Japan, India and other Asian civilizations (excluding China).
- 7.509 Oriental Art II: Chinese (3)** Main currents and monuments of Chinese art from earliest period (c. 2500 B.C.) to 1800 A.D.
- 7.700 Criticism of Painting I (3)** Intensive artistic analysis of selected masterpieces from cave paintings to the Italian Renaissance. History of criticism through Renaissance. *Prerequisite:* graduate standing or permission of instructor.
- 7.701 Criticism of Painting II (3)** Intensive artistic analysis of selected masterpieces from Italian Renaissance to present day. History of criticism from Baroque to 20th century. *Prerequisite:* graduate standing or permission of instructor.



JOURNALISM & PUBLIC RELATIONS

Associate Professors: H. D. CRAWFORD; RAY E. HIEBERT (Chairman). *Assistant Professors:* HARRY LEE; KARLEN MOORADIAN; JACK C. SEIGLE. *Adjunct Professors:* LUDWIG CAMINITA, JR.; GEORGE CREEL; JAMES MOCK; FRANK MORTIMER; CARL SHIPLEY. *Professorial Lecturers:* PAUL R. HILL; BERNARD POSNER; EDWIN TRIBBLE; R. LYLE WEBSTER. *Lecturers:* GEORGE ALLEN; CHARLES GLAZER; PEARL HANSON; RICHARD SALEM; IRVING A. SPALDING; LAURENCE STERN; JULES WITCOVER; WALTER H. WOOD; THOMAS A. ZIEBARTH.

DEGREE PROGRAM

Undergraduate Degree—Bachelor of Arts

University Requirements	38-43 hours
Language Requirement	12 hours

Departmental Requirements:

MAJOR IN JOURNALISM

Journalism Courses	24 hours
Related courses	12 hours
Advanced Social Sciences, Humanities, Government, and International Relations	18 hours

MAJOR IN PUBLIC RELATIONS

Journalism and Public Relations Courses	24 hours
Related Courses	12 hours
Advanced Social Sciences, Government and International Relations . .	18 hours
Electives	to complete 126 hours

Note: Typing ability is required of all majors.

Graduate Degrees—Master of Arts in Journalism; Master of Arts in Public Relations

MASTER OF ARTS IN JOURNALISM

Course Requirements: Minimum of 30 hours of approved graduate work, including 17.797-J Master's Thesis Seminar in Journalism (3-6). Of the remaining 24-27 hours, at least 12 hours must be in advanced journalism courses and 12 hours must be in communication theory courses.

Written Comprehensive Examinations: Two, including one in communication theory and one in advanced journalism.

Other Requirements: Thesis demonstrating ability to initiate and conduct original research in journalism and to write effectively.

MASTER OF ARTS IN PUBLIC RELATIONS

Course Requirements: Minimum of 30 hours of approved graduate work, including 17.797-P Master's Thesis Seminar in Public Relations (3-6). Of the remaining 24-27 hours, at least 12 hours must be in advanced public relations courses and 12 hours must be in communication theory courses.

Written Comprehensive Examinations: Two, including one in communication theory and one in public relations.

Other Requirements: Thesis demonstrating ability to initiate and conduct original research in public relations and to write effectively.

Graduate Comprehensive Examination Fields

JOURNALISM

17.1 Communication Theory, 17.4 Journalism

PUBLIC RELATIONS

17.1 Communication Theory, 17.5 Public Relations

UNDERGRADUATE COURSES

- 17.220 Survey of Mass Communication (3)** Historical, social, legal, and economic aspects of the news media; current practices and responsibilities; journalistic aspects of public relations and advertising. *Required of journalism and public relations majors.*
- 17.320 News Reporting (3)** Fundamentals of gathering newsworthy materials for publication; study of news sources, research and interview techniques; supervised writing. Typing ability necessary. *Prerequisite:* 17.220.
- 17.322 Editing (3)** Basic instruction and practice in the editing process, including copy editing, headline writing, makeup, layout, and editorial judgment. *Prerequisite:* 17.220.
- 17.325 Feature Writing (3)** Study of various types of feature articles for newspapers, syndicates, magazines, and specialized publications; practice in research, interviewing, writing, revision and the marketing of articles. *Prerequisite:* 17.220.
- 17.330 Newspaper Laboratory (1)** For students working on the student newspaper, *The Eagle*. May be repeated twice. *Prerequisite:* permission of Department.
- 17.331 Magazine Laboratory (1)** For students working on the student literary magazine, *The Writer*, or the student humor magazine, *The Bald Eagle*. May be repeated twice. *Prerequisite:* permission of Department.
- 17.332 Yearbook Laboratory (1)** For students working on the student yearbook, *The Talon*. May be repeated twice. *Prerequisite:* permission of Department.
- 17.422 Magazine Journalism (3)** Survey of contemporary periodicals, their backgrounds, trends, functions, staff organization, free lance sources, editorial policies and practices. *Prerequisite:* 17.220.
- 17.423 Pictorial Journalism (3)** Study of photographic requirements and professional techniques for newspapers, magazines, syndicates, and specialized publications. Picture planning and taking; selection and editing photographs for publication. *Prerequisite:* 17.220.

- 17.428 **TV-Radio News (3)** Study and practice in the special application of news writing and editing to the broadcasting media, including use of wire copy and tape recorders in producing newscasts. *Prerequisite:* 17.320.
- 17.430 **Business Journalism (3)** Survey of policies and practices of newspapers and periodicals devoted to business and industry, including employee publications, house organs, and newsletters. *Prerequisite:* 17.220.
- 17.432 **Community Journalism (3)** Study and discussion of special problems of the community, suburban, and special-interest dailies and weeklies. *Prerequisite:* 17.220.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

JOURNALISM

- 17.520 **Advanced Editing (3)** Advanced training to develop editorial judgment and skills in processing material for publication; study of problems and practices in making assignments, handling departments, and dealing with copy. *Prerequisite:* 17.322.
- 17.521 **Editorial Writing (3)** Editorial page policies and practices; supervised writing of various types of editorials on current subjects; analysis of editorial columns and interpretive reviews. *Prerequisites:* 17.320 and 17.322.
- 17.524 **Advanced News Reporting (3)** Advanced training in writing news for publication, with emphasis on specialized areas of coverage; students cover assignments in selected fields. *Prerequisite:* 17.320.
- 17.526 **Advanced Feature Writing (3)** Principles and methods of writing feature stories for publication. Individual attention to problems. Students submit articles for publication. *Prerequisite:* 17.325.
- 17.528 **Advanced TV-Radio News (3)** Advanced training in writing, editing and producing newscasts for the broadcasting media, with emphasis on the problems of broadcast news analysis and commentary. *Prerequisite:* 17.428.
- 17.532 **Publication Layout and Design (3)** Study of layout, typography, design, and printing in the planning and production of newspapers, magazines, books, brochures, and folders. *Prerequisite:* permission of Department.
- 17.536 **Government News Reporting (3)** Special problems in covering the White House, Congress, U.S. Departments, Agencies and Courts, utilizing facilities in Washington as a laboratory for intensive study and writing practice. *Prerequisite:* 17.320.

PUBLIC RELATIONS

- 17.540 **Principles of Public Relations (3)** Historical development of public relations; economic and social factors in relations between publics and media in the formation of public opinion. Case studies of current practices. *Prerequisite:* 17.220.
- 17.541 **Publicity Writing (3)** Writing for public relations, publicity, and promotional programs; preparation of news releases, articles for magazines and trade journals, broadcasting scripts and promotional booklets. *Prerequisites:* 17.320 and 17.540.

- 17.542 Promotional Campaigns (3)** Case studies of promotional methods of business, government, and social organizations; development of a promotional campaign by each student. *Prerequisite:* 17.540.
- 17.543 Public Relations Overseas (3)** Problems of public relations in international trade and diplomacy; case studies of American business public relations practices in other countries; analysis of U.S.I.A. programs. *Prerequisite:* permission of Department.
- 17.544 Public Relations in Government (3)** Analysis of objectives and problems of governmental agencies in their relations with various publics; case studies of public information programs. *Prerequisite:* 17.540.
- 17.545 Public Relations in Business (3)** Case studies in business and industrial relationships with various publics, such as labor, trade, dealer, customer, stockholder, and community. *Prerequisite:* 17.540.
- 17.546 Audio-Visual Communication (3)** Study of the problems of picturing abstract ideas and information through exhibits, graphics, cinema, television, and other audio-visual arts for advertising, education, and public relations. *Prerequisite:* permission of Department.

COMMUNICATION THEORY

- 17.500 Communication History (3)** Evolution and development of newspapers, magazines, radio, television, and motion pictures as communication media. Influence of historic backgrounds on contemporary ethics and practices. *Prerequisite:* 17.220.
- 17.501 Communication Law (3)** Current legal problems and theory of controls in journalism, visual communication, television and radio. Analysis of libel suits, copyrights, infringements. No previous knowledge of law required. *Prerequisite:* permission of Department.
- 17.503 Mass Media in Society (3)** The role of newspapers, magazines, broadcasts, motion pictures and other mass media in society and their impact on world affairs. *Prerequisite:* 17.220.
- 17.507 Freedom of Information (3)** Investigation of access and barriers to information at local, state, national and international levels. Information access rights and responsibilities of communication media. Individual research projects. *Prerequisite:* 17.220.
- 17.620 Seminar in Journalism (3)** Specialized and current problems in journalism, with emphasis on individual research projects. Topic of the seminar varies. *Prerequisite:* permission of Department.
- 17.640 Seminar in Public Relations (3)** Special problems in the formulation of policies for long-range public relations programs. Emphasis on individual research projects. *Prerequisite:* permission of Department.
- 17.660 Seminar in Media Research (3)** Development, analysis, and use of research tools relating to all communications media, including audience, communicator, and content analysis, measurement technique and statistical devices. *Prerequisite:* permission of Department.

THESIS SEMINARS

- 17.797-J Master's Thesis Seminar in Journalism (3-6).**
- 17.797-P Master's Thesis Seminar in Public Relations (3-6).**

DEPARTMENT OF MUSIC

Professors: JAMES L. McLAIN; GORDON H. SMITH. *Associate Professors:* LLOYD ULTAN (Chairman); EVELYN SWARTHOUT HAYES. *Assistant Professor:* GEORGE C. SCHUETZE JR. *Instructor:* THOMAS H. HILL. *Adjunct Professor:* ESTHER W. BALLOU. *Professorial Lecturers:* CHARLES CROWDER; VERA N. ROSS. *Lecturers:* JANET BABIGAN; ABE CHERRY; BETTY DOVE; MARK ELLSWORTH; SIDNEY FORREST; GEORGE FOSS; OLGA GAZDA; MARGARET HASSELL; DONALD HEFNER; MORRIS KIRSHBAUM; PATRICIA LARKIN; HARLAN J. LAUFMAN; CAROLYN LONG; CLARE S. MACKEY; HARRY MCCLURE; SYLVIA MEYER; SOPHOCLES PAPAS; WILLIAM S. PARTRIDGE; KENNETH PASMANICK; CONSTANCE RUSSELL; ARMAND SARRO; AARON L. SHEARER; MARK THOMAS; ROBERT E. ZIPP.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements **38-43 hours**

Language Requirement **12 hours**

Departmental Requirements:

Major Courses **57 hours**

Including: 43.102 Elementary Harmony I (3), 43.103 Elementary Harmony II (3), 43.104 Elementary Ear Training and Sight Singing I (1), 43.105 Elementary Ear Training and Sight Singing II (1), 43.300 History of Music I (3), 43.301 History of Music II (3), 43.302 Advanced Harmony I (3), 43.303 Advanced Harmony II (3), 43.304 Advanced Ear Training and Sight Singing I (1), 43.305 Advanced Ear Training and Sight Singing II (1), 43.306 Conducting I (2), 43.307 Conducting II (2), 43.308 Sixteenth Century Counterpoint (2), 43.309 Eighteenth Century Counterpoint (2), 43.310 Form and Analysis (3), 43.311 Orchestration (2), 43.312 Keyboard Harmony I (2), 43.313 Keyboard Harmony II (2); and 10 hours of Applied Music.

All music majors must choose a related specialization from the following: music history and literature; music theory; music education; or performance. A minimum of eight hours of advanced work in the chosen specialized area must be completed. Students in every specialization will be expected to demonstrate a reasonable proficiency on their major instrument or voice and a minimal proficiency at the keyboard.

All students majoring in music are required to participate in a faculty-conducted ensemble related to their performance area for a minimum of six semesters.

Electives **to complete 126 hours**

Graduate Degree—Master of Arts in music theory and composition; music history and literature; music education; or performance.

Course Requirements: Minimum of 30 hours of approved graduate work, including 43.797 Master's Thesis Seminar (3-6).

Written Comprehensive Examinations: Three from among the following general areas: Composition, Music Education (Instrumental or Vocal), Music History and Literature. No more than one examination may be selected from each

of the specific period or form areas, except that three may be selected from Music History and Literature in which case one must be General History of Music.

Other Requirements: Proficiency in French, German, or an approved substitute. Research thesis; or public recital of professional character and a written research report in the field of Music History and Literature related to the recital; or, composition of a work in one of the larger forms of music to be approved in advance by the thesis adviser and a written analysis or public performance of the composition.

Graduate Comprehensive Examination Fields

43.10 Composition, 43.11 General History of Music, 43.12 Renaissance Music, 43.13 Baroque Music, 43.14 Classic Music, 43.15 Romantic Music, 43.16 Modern Music, 43.20 History of the Opera, 43.23 History of Chamber Music, 43.24 Contrapuntal Form, 43.30 Music Education: Vocal, 43.31 Music Education: Instrumental.

UNDERGRADUATE COURSES

HISTORY AND LITERATURE

- 43.100 Appreciation of Music I (3)** Materials of music as they relate to listening. The development of aural analysis techniques; a survey of the principal forms through a study of representative works.
- 43.101 Appreciation of Music II (3)** Continuation of development of aural analytical techniques; continuation of formal survey, further study of styles of composers from Baroque period to the present. *Prerequisite:* 43.100.
- 43.300 History of Music I (3)** Development of music in Western civilization from the modal structures of the Greeks to the Baroque era. *Prerequisite:* 43.103.
- 43.301 History of Music II (3)** Development of music in Western civilization from the Baroque era to the present day. *Prerequisite:* 43.300.

THEORY

- 43.102 Elementary Harmony I (3)** Review of the elements of music, chord construction, triads and inversions, elementary chord progressions.
- 43.103 Elementary Harmony II (3)** Dominant and secondary seventh chords, non-chord tones, simple modulations. *Prerequisite:* 43.102.
- 43.104 Elementary Ear Training and Sight Singing I (1)** Simple rhythmic, melodic, and harmonic dictation; practice in sight singing (Solfege). (To be taken concurrently with 43.102).
- 43.105 Elementary Ear Training and Sight Singing II (1)** Continuation of rhythmic, melodic, and harmonic dictation; continued practice in sight singing (Solfege). (To be taken concurrently with 43.103). *Prerequisite:* 43.104.
- 43.115 Class Piano (1)** Beginning piano study directed toward satisfaction of the Department's minimal piano requirements. May be repeated for credit.
- 43.302 Advanced Harmony I (3)** Extended alteration and modulation; chorale harmonization. *Prerequisite:* 43.103.

- 43.303 Advanced Harmony II (3)** Ninth, eleventh, thirteenth chords; simple 12-tone and polytonal exercises. *Prerequisite:* 43.302.
- 43.304 Advanced Ear Training and Sight Singing I (1)** Advanced rhythmic, melodic, and harmonic dictation; further practice in sight singing (Solfege). (To be taken concurrently with 43.302). *Prerequisite:* 43.105.
- 43.305 Advanced Ear Training and Sight Singing II (1)** Continuation of 43.304 (To be taken concurrently with 43.303). *Prerequisite:* 43.304.
- 43.306 Conducting I (2)** Practical study of basic conducting techniques; emphasis on choral conducting. *Prerequisite:* 43.303.
- 43.307 Conducting II (2)** Orchestral conducting; score reading and interpretation. *Prerequisite:* 43.306.
- 43.308 Sixteenth Century Counterpoint (2)** Strict modal counterpoint through five species in two and three part. *Prerequisite:* 43.303.
- 43.309 Eighteenth Century Counterpoint (2)** Tonal counterpoint in two, three and four part; free and invertible counterpoint; canon; small contrapuntal forms. *Prerequisite:* 43.308.
- 43.310 Form and Analysis (3)** Techniques of harmonic and formal analysis applicable to representative masterworks from all periods. *Prerequisite:* 43.303.
- 43.311 Orchestration (2)** Scoring for various chamber ensembles up to full orchestration. Analysis of orchestration practice of master composers from classic era to present. *Prerequisite:* 43.303.
- 43.312 Keyboard Harmony I (2)** Keyboard practice of chord progressions in four parts; cadence patterns; simple melodic harmonizations; harmonic sequences. *Prerequisite:* 43.103.
- 43.313 Keyboard Harmony II (2)** Continuation of 43.312; modulation and transposition; special projects for individual needs. *Prerequisite:* 43.312.
- 43.315 Composition I (3)** Individually supervised practice in writing short compositions in specified small forms. *Prerequisites:* 43.303 and concurrent registration in 43.308.
- 43.316 Composition II (3)** Continuation of 43.315; assignments adapted to individual needs and talents of students. *Prerequisites:* 43.315 and concurrent registration in 43.309.

MUSIC EDUCATION

- 43.140 Introduction to Music Education (3)** History of music education, contemporary philosophy and objectives of music education in the elementary and secondary schools; scope and sequence of the music curriculum appropriate to general, choral and instrumental instruction.
- 43.149 Class Instrumental Study: Brass (1)** Performance on brass instruments embodying fundamentals of embouchure formation, fingering, breathing and principles of pedagogy relating to the brass instruments; methods and materials.
- 43.150 Class Instrumental Study: Strings (1)** Performance on stringed instruments embodying fundamentals of position, fingering and bowings; principles of pedagogy relating to the string family; methods and materials.

- 43.151 Class Instrumental Study: Woodwinds (1)** Performance on woodwind instruments embodying fundamentals of embouchure formation, fingering, breathing; principles of pedagogy relating to the family; methods and materials.
- 43.352 Music for Elementary School Teachers (3)** Technical background and methods of presentation for teaching music as a part of regular classroom instruction.
- 43.360 Instrumental Music: Methods and Materials (3)** Survey of materials for building repertoire appropriate to various instrumental groupings; principles of pedagogy relating to the percussion family; methods and materials. *Prerequisite:* 43.140.
- 43.361 Vocal Music in the Elementary School: Methods and Materials (3)** Principles, procedures and materials for the general music program in the elementary school. *Prerequisite:* 43.140.
- 43.362 Vocal Music in the Secondary School: Methods and Materials (3)** Principles, procedures and materials for the general and choral music program in secondary schools. *Prerequisite:* 43.140.

APPLIED MUSIC

(All undergraduate courses in Applied Music may be repeated for credit.)

- 43.120 Private Instrumental or Vocal Study (1-2)** Limited to students not majoring in music.
- 43.130 Private Instrumental or Vocal Study (2)** Limited to students majoring in music.
- 43.152 University Chorale (1)** Prepares and presents major works of choral literature. *Prerequisite:* audition.
- 43.153 University Singers (1)** A small, highly select choral ensemble which presents both sacred and secular programs. *Prerequisite:* audition.
- 43.154 University Orchestra (1)** *Prerequisite:* audition.
- 43.155 Instrumental Ensemble (1)** Chamber ensembles are organized each year on the basis of student interest. *Prerequisite:* audition.
- 43.220 Private Instrumental or Vocal Study (1-2)** *Prerequisite:* 43.120 or equivalent. Limited to students not majoring in music.
- 43.230 Private Instrumental or Vocal Study (2)** *Prerequisite:* 43.130 or equivalent. Limited to students majoring in music.
- 43.320 Private Instrumental or Vocal Study (1-2)** *Prerequisite:* 43.220 or equivalent. Limited to students not majoring in music.
- 43.325 Private Instrumental or Vocal Study (4)** Enrollment limited. *Prerequisite:* audition and permission of Department Chairman.
- 43.330 Private Instrumental or Vocal Study (2)** *Prerequisite:* 43.230 or equivalent. Limited to students majoring in music.
- 43.420 Private Instrumental or Vocal Study (1-2)** *Prerequisite:* 43.320 or equivalent. Limited to students not majoring in music.
- 43.425 Private Instrumental or Vocal Study (4)** Enrollment limited. *Prerequisite:* audition and permission of Department Chairman.

- 43.430 Private Instrumental or Vocal Study (2)** *Prerequisite:* 43.330 or equivalent. Limited to students majoring in music.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

HISTORY AND LITERATURE

- 43.500 The Baroque Era (3)** Study of the thorough-bass period; development of styles and techniques from 1600 through Bach and Handel. (To be offered in alternate years) *Prerequisite:* 43.301.
- 43.501 The Classic Era (3)** The pre-Classical schools; the Viennese classics, Haydn, Mozart, Beethoven, masters of the classic style. (To be offered in alternate years) *Prerequisite:* 43.301.
- 43.502 The Romantic Period (3)** Historical and cultural background; intensive study of the composers and works of the period; emphasis on individual styles; nationalism, program music. (To be offered in alternate years.) *Prerequisite:* 43.301.
- 43.503 Music of the Twentieth Century (3)** The developments in music during the past 60 years; detailed analysis of the most important trends and a survey of "isms" and splinter group contributions. (To be offered in alternate years) *Prerequisite:* 43.301.
- 43.504 Chamber Music Literature (3)** Historical and stylistic survey of string quartet, woodwind quintet and other small ensemble literature from the Baroque to the twentieth century. (To be offered in alternate years) *Prerequisite:* 43.301.
- 43.505 Orchestral Literature (3)** Historical and stylistic survey through comprehensive analyses of specific representative works. (To be offered in alternate years) *Prerequisite:* 43.301.
- 43.506 The Opera (3)** Development of operatic style through study of representative works from 1600 to the present. (To be offered in alternate years) *Prerequisite:* 43.301.
- 43.510 Bibliography and Research Techniques (3)** Bibliographical studies; transcription of early notations; preparation of papers for written or oral presentation. *Prerequisite:* 43.301.
- 43.701 Renaissance Music (3)** Intensive study of forms, style, techniques, and musical thought of the period through comprehensive analysis of representative works. (To be offered in alternate years) *Prerequisite:* 43.510.
- 43.702 Seventeenth Century Music (3)** Intensive study of the evolution of small and large forms; consideration of the techniques and aesthetic principles of the period. (To be offered in alternate years) *Prerequisite:* 43.510.
- 43.797 Master's Thesis Seminar (3-6)** *Prerequisite:* 43.510 for all candidates preparing a research thesis; 43.703 for Theory-Composition majors. Permission of Department Chairman required.

THEORY

- 43.507 Fugue (3)** Study of techniques of eighteenth century fugal style through analysis and creative writing. *Prerequisite:* 43.309.

- 43.700 Analytical Studies (3)** Analysis of specified works, composers, styles, idioms, forms. May be repeated for credit. *Prerequisite:* 43.310.
- 43.703 Advanced Composition (3)** Guidance in writing large forms. Assignments adapted to individual needs and talents. May be repeated one time for credit. *Prerequisite:* 43.316.
- 43.704 Twentieth Century Counterpoint (3)** Study of important contrapuntal styles of the past 60 years through analysis. Practical creative writing problems in each style studied. *Prerequisite:* 43.309.

MUSIC EDUCATION

- 43.540 Introduction to Graduate Study in Music Education (3)** Methods of research, bibliographical materials, library resources, and study techniques directed specifically toward music education objectives. *Required of all graduate students in Music Education.*
- 43.560 Music Education Seminar (Instrumental) (3)** Advanced study of instrumental music in the elementary, junior and senior high school. *Prerequisite:* 43.360.
- 43.561 Music Education Seminar (Vocal) (3)** Advanced study of vocal music in the elementary, junior and senior high school. *Prerequisites:* 43.361 and 43.362.
- 43.740 Supervision and Administration of Music Education (3)** Nature and scope of supervision, supervisory relationships, procedures and techniques; organization and improvement of music curricula, administration of music programs and development of evaluative criteria.
- 43.760 History and Philosophy of Music Education (3)** Music in history and the practices of teaching music in historical perspective; correlation of philosophies in music and music education.

APPLIED MUSIC

- 43.790 Private Instrumental or Vocal Study (1-2)** May be repeated up to six hours by those who are doing a public recital as a partial fulfillment of the thesis requirement. Others limited to four hours. *Prerequisites:* 43.420 or equivalent and written permission of the Department.

SPEECH ARTS

Professors: F. COWLES STRICKLAND; DONALD M. WILLIAMS; J. H. YOCUM (Chairman). *Associate Professor:* ROBERT M. HENDERSON. *Assistant Professors:* ROGER PENN; JEROME B. POLISKY; R. TALMADGE RUSSELL. *Instructors:* GEORGE E. GEESEY; DAVID JAMES WEBER. *Adjunct Professors:* LAWRENCE BECKERMAN; STANLEY FIELD; ZELDA KOSH; BETTY M. VETTER; S. M. VINOCOUR. *Professorial Lecturers:* LOUIS J. FRANA; SIDNEY L. KIRSTEN. *Lecturers:* PHILIP J. MOHR; JIMMIE J. SILMAN, JR.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements38-43 hours

Language Requirement 12 hours

Departmental Requirements:

Major courses 38 hours

67.100 Voice Science; 67.122 Introduction to Theatre; 67.130 Introduction to Broadcasting; 67.210 Argumentation; 67.222 Stagecraft; 67.281 Broadcasting Procedures; 67.492 Seminar in Speech Arts; 67.494 Seminar in Rhetorical Theory or 67.495 Seminar in History and Criticism of Public Address; 67.550-51, History of Theatre I and II; two hours of Speech Arts activities courses, and a minimum of two more approved courses in selected area of emphasis.

Related courses 15 hours

Fifteen hours of courses beyond the introductory course in a department other than the Department of Speech Arts chosen in consultation with department adviser.

Electivesto complete 126 hours

Graduate Degree—Master of Arts

Course Requirements: Minimum of 30 hours of approved graduate work, including 67.797 Master's Thesis Seminar (3-6).

Written Comprehensive Examinations: Three, including one in a core field of one of the major department areas: broadcasting, rhetorical theory and public address, theatre; and two in specialized fields, one of which must be in the Department of Speech Arts. Or one 8 hour comprehensive covering the three areas in Speech Arts.

Other Requirements: Thesis and oral defense of thesis.

Graduate Comprehensive Examination Fields

Core Fields. 67.1 Rhetorical Theory and Public Address, 67.2 Theatre, 67.3 Broadcasting.

Specialized Fields. 67.10 Speech Pedagogy, 67.11 Rhetorical Theory, 67.12 History and Criticism of Public Address, 67.20 Theatre History, 67.21 Theatre Production, 67.30 Broadcasting Production and Direction, 67.31 Broadcasting Programming, 67.32 Educational Broadcasting, 67.40 Writing for Broadcasting and Theatre, 67.41 Motion Picture and Television Film Production.

UNDERGRADUATE COURSES

- 67.100 Voice Science (3)** An examination of the fundamental processes underlying the production, transmission, and reception of the spoken sound.
- 67.110 Public Speaking (3)** The principles of public speaking, sound standards for evaluating speeches, and practice in the preparation and presentation of several types of public addresses.
- 67.116 Speech Arts Activities: Broadcasting (1)** A course designed to supplement the formal academic courses in broadcasting by providing the student with supervised experiences in broadcasting operational practices. *Open only to freshman and sophomores.*
- 67.118 Speech Arts Activities: Forensics (1)** A course designed for study of and participation in a variety of forms of inter-collegiate, intramural, and community speaking. *Open only to freshmen and sophomores.*
- 67.120 Speech Arts Activities: Theatre (1)** A course involving basic familiarization with theatre skills, particularly technical theatre terminology and makeup for stage and television. *Open only to freshmen and sophomores.*
- 67.122 Introduction to Theatre (3)** Survey of the various phases of contemporary theatre in relationship to its historical development, dramatic literature, and aesthetics.
- 67.130 Introduction to Broadcasting (3)** A comprehensive survey of broadcasting as a social, economic, and cultural phenomenon.
- 67.170 Oral Interpretation (3)** Analysis, interpretation, and practice in expressive reading of literature to develop ability in sharing literature with an audience.
- 67.210 Argumentation (3)** The use of reason, the nature and forms of argument, the structure of argumentative discourse, and the relationship of delivery to effective argument.
- 67.222 Technical Practices I: Stagecraft (3)** Survey of technical aspects of contemporary dramatic productions in relationship to the historical development of the physical theatre with emphasis on application through laboratory practice.
- 67.271 Pantomime (3)** A concentration on the analysis and understanding of dramatic pantomime and its relationship to creativity of the actor in dramatic presentation.
- 67.281 Broadcasting Procedures (3)** Theory and practice in the adaptation of speech methods and materials to the requirements of radio and television. Laboratory.
- 67.282 Fundamentals of Writing for Broadcasting (3)** Theory and practice of basic principles of writing for the broadcast media. Preparation of copy for the basic program types.
- 67.311 Persuasion (3)** The survey of theory of persuasion, the study of outstanding specimens of persuasive speeches, and practice in preparation and presentation of persuasive speeches.
- 67.312 Discussion (3)** The nature and role of communication in group discussion and group problem solving.

- 67.313 **Contemporary Speech Problems (3)** Study and application of unique problems and techniques involved in composition and presentation of national and international political and diplomatic public addresses.
- 67.320 **Technical Practices II (3)** Introduction to the fundamentals of perspective drawing and the graphic presentation of floor plans and elevations for design in the performing arts. Laboratory. *Prerequisite:* 67.222.
- 67.331 **Radio Production and Direction (3)** The study and application of the techniques appropriate to the production of radio programs. Laboratory.
- 67.372 **Principles of Performance I (3)** The study and analysis of the basic principles, theories, and philosophical origins of the dramatic performance as expressed through any of the contemporary entertainment media.
- 67.423 **Technical Practices III: Lighting (3)** The study of lighting instruments, control boards, and the use of lighting as an integral part of the play's design for the performing arts. Laboratory. *Prerequisite:* 67.222.
- 67.435 **TV Studio Operations (3)** Principles and practice in the operation of television studio equipment. Laboratory. Laboratory fee, \$5.
- 67.471 **Principles of Performance II: Acting (3)** The analysis of the actor's problem through a detailed exploration of the craft and techniques of the actor related to the performing arts. *Prerequisites:* 67.271 and 67.372.
- 67.492 **Seminar in Speech Arts (3)** A directed comprehensive and interpretative approach to common problems in the areas of broadcasting, rhetorical theory and public address, and theatre. *Open to non-majors with consent of instructor.*
- 67.493 **Seminar in Broadcasting (3)** Study in depth of certain areas and problems in broadcasting which are not covered in regular sequence of courses. *Prerequisite:* 6 hours in broadcasting courses or permission of instructor.
- 67.494 **Seminar in Rhetorical Theory (3)** Study of works of the principal theorists in the major periods in the development of the body of rhetorical theory. Topics will be announced the semester the course is offered.
- 67.495 **Seminar in History and Criticism of Public Address (3)** The study of the public address of a specific period or problem area through critical study of the works and methods of its principal speakers. Topics will be announced the semester the course is offered.
- 67.496 **Seminar in Theatre (3)** The study of specific problems in terms of theatrical presentation or theatre history. Topics will be announced the semester the course is offered.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

- 67.520 **Scene Design I (3)** The fundamentals of design for the performing arts, including preparation of sketches and drawings based on the principal styles from Classical to Baroque. *Prerequisite:* 67.320 or permission of instructor.
- 67.521 **Scene Design II (3)** Continuation of 67.520, from Realism to present day. *Prerequisite:* 67.520 or permission of instructor.

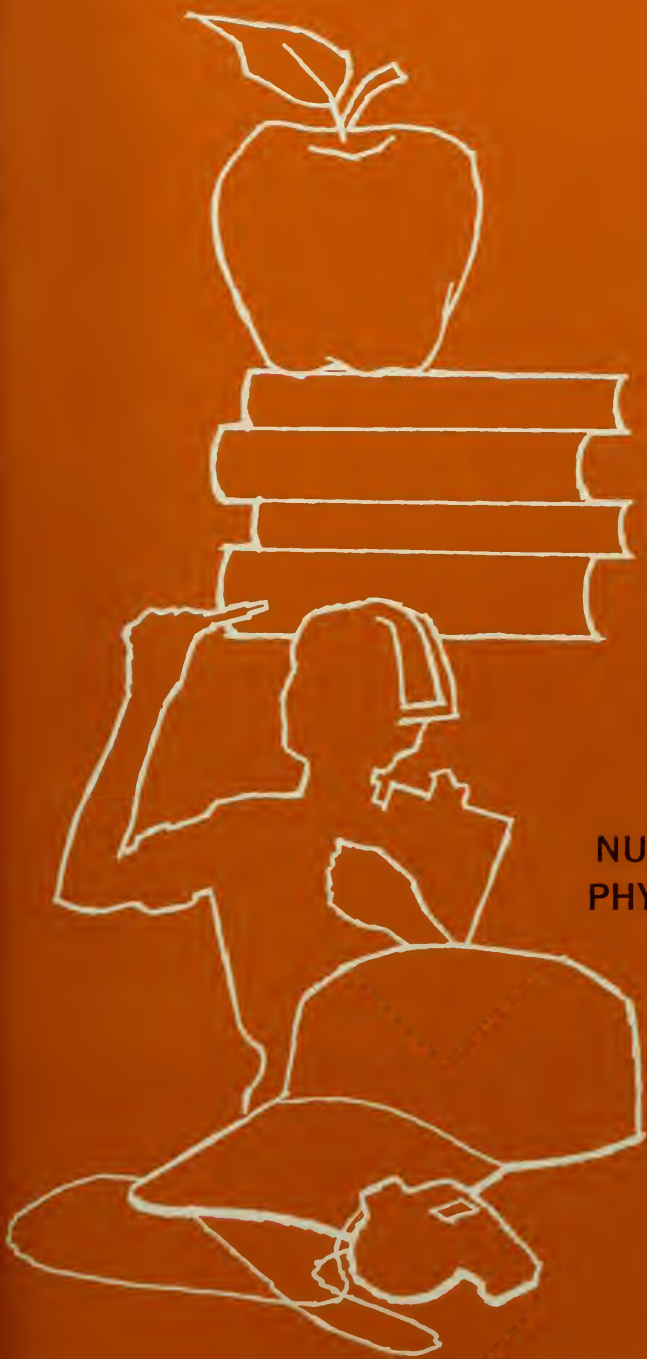
- 67.526 History of Costume (3)** The history of costume in relationship to its adaptation for contemporary dramatic presentations.
- 67.532 Principles of Performance III: Directing (3)** Direction in the theatre, including comparison with and contrast to the other dramatic media. *Prerequisite:* 67.372.
- 67.550 History of the Theatre I (3)** The development of the stage and the drama from Greek through Renaissance.
- 67.551 History of the Theatre II (3)** The development of the stage and the drama from 17th century to present.
- 67.556 History of the American Theatre (3)** The theatre in America as a cultural force from the colonial days to present.
- 67.558 History of Motion Pictures (3)** The historical development of the motion picture as an art form from its earliest development as a laboratory curiosity until the present day. Laboratory fee, \$10.
- 67.560 Principles of Dramatic Writing I (3)** Special techniques required for dramatic scripts—sketches, originals, adaptation. Emphasis on plotting, characterization, dialogue, pacing, mood. Use of music and sound for dramatic effects.



- 67.561 Principles of Dramatic Writing II: Broadcasting (3)** Practical experiences in writing the one-hour television and documentary drama. *Prerequisite:* 67.560.
- 67.562 Principles of Dramatic Writing III: Theatre (3)** Practical experience in writing the full-length play for the theatre. *Prerequisite:* 67.560.
- 67.579 Teaching of Speech Arts (3)** Designed to acquaint the prospective speech teacher with the philosophy, the theory, and the practices and methods of speech education.
- 67.581 Teaching with Television and Radio (3)** A workshop course in the adaptation of classroom methods and materials to radio and television. Laboratory fee, \$5.
- 67.583 Film Production (3)** A comprehensive introduction to the criticism, analysis, and production techniques of films for motion pictures and television. Laboratory fee, \$15.
- 67.584 TV Production and Direction I (3)** Theory and application of the basic principles and techniques of television production and direction. Laboratory fee, \$10.
- 67.585 TV Production and Direction II (3)** Advanced training in the longer, more complex and more sophisticated television program types. Laboratory fee, \$10. *Prerequisite:* 67.584.
- 67.588 Radio-TV Programming (3)** Study and application of the principles of planning radio and television programs and program schedules for majority and minority audiences.
- 67.620 Seminar in Broadcasting (3-6)** To provide the graduate student the opportunity to explore in depth certain areas and problems in broadcasting which are not covered in the regular sequence of courses. Topics will vary from semester to semester. May be repeated for credit.
- 67.630 Seminar in Rhetorical Theory (3-6)** Study of the works of the principal theorists in the major periods in the development of the body of rhetorical theory. The period and works studied will be announced from semester to semester as the course is offered. May be repeated for credit.
- 67.631 Seminar in History and Criticism of Public Address (3-6)** The study of the public address of a specific period or problem area through critical study of the works and methods of its principal speakers. Topics will be announced from semester to semester. May be repeated for credit.
- 67.640 Seminar in Theatre (3-6)** The study of specific problems in terms of theatrical presentation or theatre. Topic to be announced the semester the course is offered. May be repeated for credit.
- 67.662 Broadcasting in the Public Interest (3)** Analysis of the responsibilities of the broadcaster in terms of "public interest, convenience, and necessity"; educational broadcasting; comparison of U.S. and foreign programming.
- 67.674 TV Production Laboratory (3)** Intensive creative and experimental work in the writing, designing, or performing aspects of TV production. Laboratory fee, \$10.
- 67.797 Master's Thesis Seminar (3-6).**

DIVISION OF EDUCATION

EDUCATION
NURSING EDUCATION
PHYSICAL EDUCATION



PROFESSIONAL EDUCATION

The Division of Education, with the advice and assistance of an interdisciplinary Committee on Teacher Education, aims to prepare properly qualified and carefully selected students to become worthy members of the teaching profession. Course offerings and departmental requirements on the undergraduate level enable students to meet the requirements for certification in most of the States.

At the graduate level the Department of Education seeks to coordinate its strength in those particular areas in which the University has special competence. The Department offers programs leading to the degrees of Master of Education, Master of Arts in Education and Doctor of Education. The degree of Master of Education is awarded in recognition of the fact that the student has deepened his professional understandings and skills as well as his substantive knowledge in the field of education. The research requirements for this degree, while no less demanding than those for the degree of Master of Arts in Education, are fulfilled under closer supervision and through enrollment in two research seminars. The degree of Master of Arts in Education is oriented toward a more scholarly and academic approach to education and is distinguished, in its research feature, by the ability to carry on independent and original research in an approved area of educational interest.

For information on the Master of Science in Science Teaching degree interested individuals are referred to the description of this program in conjunction with the offerings of the Division of Natural Sciences and Mathematics.

The Doctor of Education degree recognizes highest achievement in the area of education and is awarded for demonstrated competence in a specialized field of study. Its conferral depends upon the ability of the student to demonstrate his excellence in course work, successful passing of certain required comprehensive examinations, the adequate possession of research tool subjects, and the ability to propose and execute independently a significant research project in the field of education and to defend it upon its completion.

At either the graduate or the undergraduate level the prime objective of the Division of Education is to contribute to the profession of teaching students who will command respect as professional educators and who also will merit places of educational leadership and distinction.

The objectives established for the work of the Division are a part of a carefully rationalized philosophy of professional education. This system of understanding has been developed by the faculty, accepted by the administration, and includes the following basic propositions:

1. The potential, indeed the overwhelming necessity to learn is a unique quality in man, and learning is best promoted by critical thinking. A professional educator recognizes that the complex area of human learning presents a challenging and uniquely rewarding field for study.
2. Education is central to the concept of democracy and the democratic ideal. Our democratic processes derive from a belief in the essential worth of each individual as a moral, intellectual, and social force in the community and

the world. To be a member of the teaching profession, therefore, is to be privileged to contribute to the promotion of human growth and dignity in a society of free men.

3. A teacher is a professional person who has unique personal qualities and specialized professional skills. A teacher is healthy—physically, mentally, and spiritually—and a person whose total personality will be a desirable influence upon all whom he teaches. A teacher is an educated person in the sense that he personifies for students and the community alike the larger meaning of education. The education of a teacher, therefore, must reflect breadth of interest, appreciation of values, and an understanding of human worth as well as attainment in and practice of scholarship. A teacher is a professional person with specialized training and skills which provide him with competence to meet in a professional manner the particular problems and needs that are relevant to education and the promotion of effective learning. In addition a teacher is alert to the opportunities of improving his own knowledge and seeks to gain professional insight through research.



EDUCATION

Professors: SAMUEL ENGLE BURR, JR.; JOHN W. DEVOR (Chairman); CHALMER A. GROSS; FRANCES HOLLIDAY. *Associate Professors:* E. ROBERT ADKINS; NONA BURRESS; PAUL D. LEEDY; RALPH WHITFIELD. *Visiting Associate Professor:* EDITH H. GROTEBERG. *Assistant Professors:* DENNIS D. MILLER; SUSAN S. OLSON; CHARLES W. VAN WAY, JR.; JOHN WAKEFIELD. *Adjunct Professors:* WILMER F. BENNETT; HOWARD L. DIDSBURY, JR.; WILLIAM H. JENKINS; DANIEL B. LLOYD; STANLEY V. SMITH; WARD STEWART; ROBERT N. WALKER; VIRGIL WALKER. *Professorial Lecturers:* WILLIAM R. CARRIKER; HARRY L. CHASEY; GARNEY L. DARRIN; CLARE M. GODFREY; HENRY C. GREGORY; HOWARD F. HJELM; OLIVE MCKAY; AARON N. SHEDD; LOUISE S. WALKER. *Lecturers:* VERNON L. BEGGS; KENNETH H. BRADT; EDWINA DEANS; ESTELLE C. EPSTEIN; BRUCE C. HOAK; RICHARD JAMESON; EVERETT E. JARBOE; HILDA KALER; BERNICE LAMBERTON; MILADA LEJKOVA; GEORGE A. MALE; MARGARET K. NOBLE; JOSEPH C. PAIGE; FRANCIS E. POWERS; ATLEE E. SHIDLER; SYLVIA K. SHUGRUE; TOM W. SILLS; PETER V. SWINDLER; EDNA H. TREASURE; ALBERT W. VOGEL; MARGERY H. WEST.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements 38-43 hours

Students majoring in elementary education are advised to complete 9.100 Human Biology (3); 27.100 Earth Sciences (3); one course in physical science (3); 57.200 General Psychology (3); 5.104 Introduction to the Visual Arts (3) or 7.100 Survey of Art I (3); and 43.100 Appreciation of Music I (3); as part of their University requirements.

Language Requirement 12 hours

Departmental Requirements:

Area of Concentration in a field other than Education: Students majoring in elementary education are required to have a secondary specialization for teaching in a subject-matter field or twenty-four hours in one of the following areas, eighteen of which must be in advanced courses: (a) the Humanities, (b) Natural Sciences and/or Mathematics, (c) the Social Sciences, (d) Fine and Communicative Arts, or (e) Physical Education.

Major Courses 24-27 hours

Including:

(a) 21.302 Foundations of Education: Social and Historical Bases; Philosophical and Psychological Principles (6) Required of all students in either elementary or secondary education.

(b) 21.350 Methods and Materials in Elementary Education: General and Special: Reading, Language Arts, Mathematics, Social Studies, and Natural Sciences (9).

(c) 21.444 Student Teaching: Elementary Schools: Grades K through 6 (9 or 12). Twelve weeks of full-time student teaching are required for nine semester hours of credit and sixteen weeks for twelve semester hours of credit.

Related Courses 12 hours

Related courses must be chosen from departments other than Education.

Recommended courses include: 23.563 Children's Literature, 5.380 Teaching Art in Elementary Schools; 49.310 Elementary School Rhythmic Activities; 49.335 Elementary School Play and Games; 43.352 Music for Elementary School Teachers; 57.400 Psychology of the Child; or other courses directly related to the work of the elementary teacher and approved by a faculty member of the Department of Education. No courses that are required for the elementary teacher's subject-matter area of concentration may be counted as related courses.

Secondary Teaching19-22 hours

Undergraduate students planning to teach in secondary schools must major in the field in which they plan to teach. They should complete 57.200 General Psychology as a part of their University requirements, and the following courses in the Department of Education:

(a) 21.302 Foundations of Education: Social and Historical Bases; Philosophical and Psychological Principles (6).

(b) 21.340 Methods and Materials in Secondary Education: General and Special: English, Social Studies, Science, Mathematics, and Foreign Languages (4).

(c) 21.445 Student Teaching: Secondary Schools: Grades 7 through 12 (9 or 12). Nine weeks of full-time student teaching are required for nine semester hours of credit and twelve weeks for twelve semester hours of credit.

(d) Any other courses required for certification in the state in which the student intends to teach.

Electivesto complete 126 hours

Graduate Degrees—Master of Education; Master of Arts; Doctor of Education

MASTER OF EDUCATION

Prerequisites: One course in General Psychology or the equivalent; one course in statistics or the equivalent; and a minimum of nine semester hours of undergraduate work in education. It is expected that a student who plans to work toward the Master of Education degree will be qualified for a teacher's certificate at the elementary or secondary level. This includes student teaching, teaching experience or 21.691 In-service Training Project: Internship in Education (9). A student may be admitted to a Master's degree program with not more than six semester hours of prerequisites lacking.

Course Requirements: Minimum of 30 hours of approved graduate work, including 21.504 Evaluation of Student Progress (3) and 21.520 Advanced Psychology of Education (3). A maximum of 12 hours of work may be taken in a department other than the Department of Education. If the student elects not to write a thesis, he must take 21.795 and 21.796 Research Seminars in Education in lieu of thesis. If a thesis is written, the student must take 21.795 Research Seminar in Education (3) and 21.797 Master's Thesis Seminar (3).

Written Comprehensive Examinations: Two, including one in a core field; and one in either another core field, a specialized field, or a field outside of education, if approved by the Department of Education and the department outside of education. (See detailed literature of the Department of Education.)

Other Requirements: Completion of 21.795 Research Seminar in Education I and 21.796 Research Seminar in Education II with grade of B or better; or thesis and oral defense of thesis.

MASTER OF ARTS

Prerequisites: Same as for Master of Education degree.

Course Requirements: Minimum of 30 hours of approved graduate work, including 21.797 Master's Thesis Seminar (3-6), 21.504 Evaluation of Student Progress (3), and 21.520 Advanced Psychology of Education (3). *A thesis must be written.*

Written Comprehensive Examinations: Two, including one in a core field, and one in another core field or a specialized field. (See detailed literature of the Department of Education.)

Other Requirements: Thesis and oral defense of thesis.

DOCTOR OF EDUCATION

Prerequisites: Master's degree or equivalent, with a minimum of 18 hours of undergraduate and/or graduate work in education; one course in General Psychology or equivalent; one course in statistics or equivalent; some successful teaching experience; and a satisfactory score on the Graduate Record Aptitude Examination.

Course Requirements: Minimum of 72 hours of approved graduate work, including 21.504 Evaluation of Student Progress (3); 21.520 Advanced Psychology of Education (3); 21.610 Philosophy of Education: Advanced (3); 21.795 Research Seminar in Education (3); and 21.799 Doctoral Dissertation Seminar (6). Background deficiencies may be made up, in part, while taking graduate courses, and must be completed before advancement to candidacy. All required core courses, with the exception of 21.795, must be met before applying for advancement to candidacy. At least 36 hours of graduate work (including dissertation credit) must be completed in residence at The American University.

Written Comprehensive Examinations: Five, including at least three in education, two of which must be in core fields.

Other Requirements: English Qualifying Examination, administered by the Department, before advancement to candidacy. Proficiency examinations in two tools of research (quantitative or languages). Dissertation and oral defense of dissertation. (See detailed literature of the Department of Education.)

Graduate Comprehensive Examination Fields

Core Fields: 21.1 Psychology of Education, 21.2 History and Philosophy of Education, 21.3 School Administration and Supervision.

Specialized Fields: 21.10 Elementary Education; 21.11 Secondary Education; 21.13 Comparative and International Education; 21.14 Education of the Exceptional Child; 21.15 School Guidance; 21.20 Methods and Materials of Teaching the Natural Sciences in Secondary Schools; 21.21 Methods and Materials of Teaching the Social Sciences in Secondary Schools; 21.22 Methods and Materials of Teaching English in Secondary Schools; 21.23 Methods and Materials of Teaching Mathematics in Secondary Schools. The following may be used for Master's degrees only: 21.20, 21.21, 21.22, and 21.23.

PROFESSIONAL CERTIFICATES

See page 20 of this publication and detailed literature of the Department of Education.

UNDERGRADUATE COURSES

- 21.250 Mathematics for Elementary School Teachers (3)** A course designed to provide pre-service elementary school teachers with an adequate background in the mathematics which they are expected to teach. *Prerequisite:* 41.100 Survey of Mathematics I, or equivalent.
- 21.302 Foundations of Education: Social and Historical Bases: Philosophical and Psychological Principles (6)** A block-type course including history of education, educational sociology, psychological, sociological and physiological factors of human growth and development and the learning process. Prerequisite to all other courses in the Department. Laboratory experiences are provided throughout the course. *Prerequisite:* 57.200 General Psychology.
- 21.305 Group Dynamics and Administrative Principles (3)** Systematic study of major characteristics and functions of face-to-face groups; cohesiveness, goal-setting, decision-making, styles of leadership, and membership rules. (Formerly 57.305)
- 21.320 Psychology of Education (3)** Fundamental psychological problems encountered in education. Nature and control of learning; theories of motivation; development of skills and knowledge; creative learning and critical thinking. *Prerequisite:* 57.200 General Psychology.
- 21.330 Measurement in Education (3)** Theoretical and practical use of statistical methods for prospective elementary and secondary school teachers. *Prerequisite:* one course in statistics, or the equivalent.
- 21.340 Methods and Materials in Secondary Education: General and Special: English, Social Studies, Science, Mathematics, and Foreign Languages (4)** A study of general methods and materials and applications to special subject fields. Laboratory experiences are provided in the university classroom and in secondary schools in the Washington area throughout the course. *Prerequisite:* 21.302.
- 21.342 Methods of Teaching in Secondary Schools: General (3)** Study of general teaching methods, with some opportunity to apply these principles in certain specialized subject-matter fields. *Prerequisite:* 21.302.
- 21.350 Methods and Materials in Elementary Education: General and Special: Reading, Language Arts, Mathematics, Social Studies, and Natural Sciences (9)** Study of materials and methods for use in teaching the various elementary school subjects. Laboratory experiences are provided in the university classroom and in elementary schools in the Washington area. *Prerequisite:* 21.302.
- 21.440 The Teacher and Educational Administration (3)** Study of administrative duties and relations of the teacher with reference to guidance, curriculum and financial responsibilities.
- 21.444 Student Teaching: Elementary Schools (3, 6, 9 or 12)** Actual observation, participation, and teaching. Grades K through 6. Conferences arranged with university supervisor and seminars held at frequent intervals. May be repeated, but student may not earn more than 12 credit hours in this course. Fee (in addition to tuition) all students, \$10 per credit hour up to a maximum of \$80 for 9 or 12 credit hours

- 21.445 Student Teaching: Secondary Schools (3, 6, 9 or 12)** Actual observation, participation, and teaching. Grades 7 through 12. Conferences arranged with university supervisor and seminars held at frequent intervals. May be repeated, but student may not earn more than 12 credit hours in this course. Fee (in addition to tuition) all students, \$10 per credit hour up to a maximum of \$80 for 9 or 12 credit hours.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

FOUNDATIONS OF EDUCATION

- 21.500 History of Education in American Culture (3)** The development of American education from colonial times to the present; emphasizing cultural forces, intellectual currents, dominant philosophies, actual educational practices, and major educational problems.
- 21.501 Philosophy of Education (3)** A course for graduate and advanced undergraduate students in the processes, purposes, and methods of education, with special reference to the organization of the school and its curriculum. *Prerequisite:* permission.
- 21.504 Evaluation of Student Progress (3)** Materials and methods for use in evaluating student progress, especially at the elementary and secondary school levels. *Required of all students working on graduate degree programs in education. Prerequisite:* One course in statistics or equivalent.
- 21.517 The School and Modern Social Problems (3)** Study and analysis of the social basis of the curriculum. Special reference to pupil needs. Current developments; methods of adapting the school to society. *Prerequisite:* permission.
- 21.520 Advanced Psychology of Education (3)** Psychological principles, research methods basic to education. Consideration of motivation, attitudes, mental abilities, psychology of school subjects. *Required of all students taking graduate degree programs in education. Prerequisite:* 57.200 General Psychology, or permission.
- 21.527 Mental Health Aspects of Education (3)** Study of the development of wholesome relationships involving administrators, teachers, pupils, and other educational personnel. Some phases of the daily work of the teacher in the area of good mental hygiene are considered.
- 21.575 History of Education in Western Culture (3)** The development of Western education from ancient Greece to modern times, emphasizing social, intellectual, religious, economic, and political factors; individual philosophers, and actual educational practices.
- 21.610 Philosophy of Education: Advanced (3)** Study of doctrines and principles underlying public and private education in America. Special consideration of purposes, processes and methods of elementary and secondary education. A seminar type course open only to graduate students.

ELEMENTARY EDUCATION

- 21.516 Special Educational Programs for the Handicapped (3)** A study of methods, devices and techniques for use in the teaching of physically, socially, and emotionally handicapped children in public and private schools.

- 21.518 Special Educational Programs for Retarded Pupils (3)** Provisions for class work and group activities for retarded children in public and private schools emphasizing methods, materials, and objectives.
- 21.519 Physical Sciences for Elementary School Teachers (3)** Recent findings in the fields of chemistry and physics, with special reference to science knowledge expected on the part of the elementary school teacher.
- 21.521 Biological and Geological Sciences for Elementary School Teachers (3)** Recent findings in the fields of biology and geology with special reference to science knowledge expected on the part of the elementary school teacher.
- 21.522 Special Educational Programs for Gifted Pupils (3)** Provisions for class work, group and individual activities for gifted children in elementary and secondary schools. Emphasis on methods, materials and objectives.
- 21.542 Curriculum Construction in Elementary Schools (3)** Methods and procedures used in curriculum construction for modern elementary schools. Study of certain selected curricula in use today.
- 21.642 Current Trends and Practices in Elementary Education (3)** A survey of current developments in American elementary schools.

SECONDARY EDUCATION

- 21.516 Special Educational Programs for the Handicapped (3)** See Elementary Education.
- 21.518 Special Educational Programs for Retarded Pupils (3)** See Elementary Education.
- 21.522 Special Educational Programs for Gifted Pupils (3)** See Elementary Education.
- 21.640 Curriculum Construction in Secondary Schools (3)** Psychological, cultural, and educational bases of secondary school curriculum. Practice in construction of curricular materials to meet modern educational problems.

SCHOOL ADMINISTRATION AND SUPERVISION

- 21.561 Supervision of Student Teachers (3)** A course designed to provide guidance for the supervising teacher and others in their work with student teachers.
- 21.650 Essentials of School Law (3)** Study of the laws governing education in the United States, with special reference to the District of Columbia, Maryland, and Virginia.
- 21.661 Elementary School Administration (3)** A course designed to help prospective elementary school administrators acquire better knowledge and understanding of administrative principles, concepts, and practices which are used in elementary schools.
- 21.662 Secondary School Administration (3)** A course designed to help prospective secondary school administrators acquire a better knowledge and understanding of administrative principles, concepts, and practices which are used in secondary schools.
- 21.663 Problems of School Management (3)** A problems approach to the study of internal school management; administrative problems related to pupil and teacher personnel.

- 21.664 Financial and Business Administration for Schools (3)** School budgets, bonds and taxes. Selecting, buying and distributing supplies and equipment. Accounting systems for finances and materiel. Other business aspects of education.
- 21.670 School Supervision (3)** A course designed for prospective and in-service supervisors of elementary and secondary schools. Purposes and techniques of supervision are discussed.

COMPARATIVE AND INTERNATIONAL EDUCATION

- 21.580 Problems in Federal Educational Policy (3)** Philosophical basis for relationship between American educational systems and government at local, state, and national levels. Comparisons with educational systems abroad. Implications of education for national defense and improved world understanding.
- 21.581 Issues and Programs of International Education (3)** Survey of educational activities designed to improve international relations and world understanding, including the international educational exchange programs, technical assistance missions, and UNESCO.
- 21.615 Comparative Education I: The Western World (3)** Survey and comparison of educational plans and procedures used in various countries. Greatest attention is directed to education in the United Kingdom, France, Germany, Canada, and the Latin American nations.
- 21.616 Comparative Education II: The Orient (3)** Similar to 21.615, with emphasis upon the educational programs of the Far East, rather than the Western World.

GUIDANCE AND COUNSELING

- 57.505 Psychological Tests and Measurements II (3)** See Department of Psychology.
- 57.506 Psychological Tests and Measurements III (3)** See Department of Psychology.
- 54.550 Personnel Psychology (3)** See School of Government and Public Administration.
- 57.572 Principles and Practices of Guidance (3)** See Department of Psychology.
- 21.625 Organization and Administration of Guidance Services (4)** Principles, procedures, and practices in the organization and administration of guidance services, with special emphasis on informational services.
- 57.670 Techniques of Counseling (3)** See Department of Psychology.

WORKSHOPS, SEMINARS AND INTERNSHIPS

- 21.566 Practical Procedures for Use in Today's Schools I (3)** Workshop type course covering selected phases of principles, methods, curriculum construction, supervision, and administration.
- 21.567 Practical Procedures for Use in Today's Schools II (3)** Continuation of 21.566.

- 21.691 In-Service Training Project: Internship in Education (9-12)** Internships in cooperating local school systems by a limited number of properly qualified persons as an integral part of their degree programs. *Prerequisites: advancement to candidacy for M.Ed. or Ed.D. degree; permission of the Chairman, Department of Education, and the Dean of the College of Arts and Sciences.*
- 21.710 Seminar in Teaching (3)** To operate as a cycle stressing, from semester to semester, the following areas: curriculum construction, public relations, school administration and supervision, educational research, and methods and materials of teaching. (May be repeated for credit.)
- 21.795 Research Seminar in Education I (3)** Fundamentals, methodology and materials for educational research. Required of all students who plan to write a master's thesis, a doctoral dissertation, or a thesis option paper. *Prerequisite: advancement to candidacy for a Master's or Doctor's degree.*
- 21.796 Research Seminar in Education II (3)** A seminar type course in which a comprehensive research paper is required. Designed especially for M.Ed. candidates as a thesis alternative.
- 21.797 Master's Thesis Seminar (3-6)** At least three hours required of all students working on a master's thesis.
- 21.799 Doctoral Dissertation Seminar (6)** Required of all students working on doctoral dissertations.

Student teacher in high school classroom



HEALTH, PHYSICAL EDUCATION AND RECREATION

Professor: STAFFORD H. CASSELL. *Associate Professors:* DAVID L. CARRASCO; THOMAS W. EVAUL (Chairman); VIRGINIA E. HAWKE; JOSEPHINE W. HUBBELL. *Assistant Professors:* GAY E. CHENEY; ROBERT H. FRAILEY; RUTH E. McFEETER; HOWARD SORRELL; JAMES A. WILLIAMS III. *Adjunct Professor:* HUGO SCHULZE. *Professorial Lecturer:* ROSWELL D. MERRICK. *Lecturers:* WALLACE B. HAGERHORST; WILLIAM S. LEE.

DEGREE PROGRAMS

Undergraduate Degree—Bachelor of Arts

University Requirements **43 hours**

Students majoring in Health and Physical Education should complete 15.100 Science of Chemistry (3), 9.110 General Zoology (4), 9.102 Human Anatomy (3), 9.104 Human Physiology (3-4), 57.200 General Psychology (3), 49.101 Personal Health (1), and 49.102 Orientation to Physical Education (1) as part of their University requirements.

Language Requirement **12 hours**

Departmental Requirements:

Major Courses **29-39 hours**

Core Courses (23-29 hours)

49.121 History and Principles (3); 49.220 First Aid (2); 6 to 12 hours selected in consultation with adviser from 49.201, 202, 203, 204, 205, 206, 207, 208, and 209, The Teaching of Activities (1 each); 49.320 Methods of Teaching (3); 49.421 Organization and Administration (3); 49.424 Kinesiology and Physiology of Exercise (3); 49.500 Measurement and Evaluation (3).

Areas of Specialization (6-10 hours)

Secondary Health and Physical Education (6 hours)

49.330 Health and Safety Education (3), and 3 hours selected in consultation with department adviser.

Elementary School Physical Education (6 hours)

49.310 Elementary Rhythmic Activities (3), and 49.335 Elementary School Play and Games (3).

The Dance (10 hours)

49.210 Dance Production (1), 49.325 Rhythms and Accompaniment (2), 49.326 History and Philosophy (3), 49.400 Advanced Methods of Teaching Dance (1), 49.401 Dance Composition (3).

Related Courses **18 hours**

21.445 Student Teaching (6-12), and other education courses selected in consultation with department adviser.

Tool Course **3 hours**

67.110 Public Speaking (3).

Electives (second teaching field) **to complete 126 hours**

Professional Certificate (Undergraduate)

Athletic Coaching 19 hours

(For men majoring in other areas desiring professional qualifications for coaching) 49.201, 202, 203, 204, 206, 207, 208, 209 The Teaching of Sports (8); 49.220 First Aid and Athletic Injuries (2); 49.324 Principles and Psychology of Coaching (3); 49.421 Organization and Administration (3); 49.424 Kinesiology and Physiology of Exercise (3); and participation in one or more sports (see department adviser).

Graduate Studies—The Department of Health, Physical Education and Recreation offers a specialization in Health and Physical Education through the established Master of Arts and Master of Education programs in the Department of Education. Students electing this specialization should take 49.500 Measurement and Evaluation in Health and Physical Education (3) in place of 21.504 Evaluation of Student Progress (3); and must elect 49.1 Health and Physical Education as one of their two required comprehensive examination fields.

Graduate Comprehensive Examination Field

49.1 Health and Physical Education.

UNDERGRADUATE COURSES

49.101 Personal Health (1) Survey of problems in personal and community health with the presentation of scientific knowledge that will enable the student to overcome these problems. *Must be taken by all fulltime undergraduates during the fall or spring semester of their first year.*

49.102 Orientation to Physical Education (1) The role of physical activity in society and the life of the individual. Instruction and experience in activities that can contribute to personal fitness. *Must be taken by all fulltime undergraduates during the fall or spring semester of their first year.*

49.103 Physical Education Activities (1) Instruction in the fundamentals of selected sports and recreational activities on both a beginning and intermediate level. Each semester consists of two activities.
Activities include Archery, Aquatic Games, Badminton, Bait and Fly Casting, Bowling, Camping, Diving, Fencing, Golf, Life Saving, Modern Dance, Social Dance, Square Dance, Skin & SCUBA Diving, Swimming, Tennis, Volleyball, and Weight Training.

Prerequisite: 49.102 Orientation to Physical Education.

49.121 History and Principles of Health, Physical Education and Recreation (3) An introduction to the professions of health education, physical education and recreation. Consideration of development, role in general education, and scientific principles guiding the conduct of these programs.

49.201M The Teaching of Football (1) The development of skills, techniques, and methods in teaching football, including rules and team organization (men only).

- 49.201W The Teaching of Soccer (1)** The development of skills, techniques and methods in teaching soccer including rules and team organization (women only).
- 49.202M The Teaching of Basketball (1)** The development of skills, techniques, and methods in teaching basketball including rules and team organization (men only).
- 49.202W The Teaching of Dance (Beginning) (1)** The development of skills, methods and techniques in teaching dance at the beginning level.
- 49.203M The Teaching of Soccer (1)** The development of skills, techniques, and methods in teaching soccer including rules and team organization (men only).
- 49.203W The Teaching of Field Hockey (1)** The development of skills, techniques, and methods in teaching field hockey including rules and team organization (women only).
- 49.204M&W The Teaching of Gymnastics (1)** The development of skills, methods, and techniques in teaching gymnastics (men and women).
- 49.205M&W The Teaching of Individual, Dual, and Recreational Activities (1)** The development of skills and methods in teaching Archery, Badminton, Bowling, Golf, Social Dance, Square Dance, Tennis, and Volleyball. Two different activities are included each semester; course may be repeated four times. *Prerequisite:* permission of Department Chairman.
- 49.206M&W The Teaching of Swimming (1)** The development of skills, techniques, and methods in teaching swimming (men and women).
- 49.207M The Teaching of Track and Field (1)** The development of skills, techniques and methods in teaching track and field including rules and team organization (men only).
- 49.207W The Teaching of Dance (Intermediate) (1)** The development of skills, methods and techniques in teaching dance at the intermediate level (women only).
- 49.208M The Teaching of Wrestling (1)** The development of skills, techniques and methods in teaching wrestling including rules and team organization (men only).
- 49.208W The Teaching of Basketball (1)** The development of skills, techniques and methods in teaching basketball including rules and team organization (women only).
- 49.209M The Teaching of Baseball (1)** The development of skills, techniques and methods in teaching baseball including rules and team organization (men only).
- 49.209W The Teaching of Softball (1)** The development of skills, techniques and methods in teaching softball including rules and team organization (women only).
- 49.210 Workshop in Dance Production (1)** The development of techniques and the provision of experience in the various phases of dance production. May be repeated for credit.
- 49.220 First Aid and Athletic Injuries (2)** Techniques of administering immediate and temporary care to an injured person with emphasis on the prevention and treatment of injuries prevalent in athletics.

- 49.301 Water Safety Instructor (2)** Preparation for the teaching of swimming and diving. Techniques of aquatic safety. *Prerequisite:* 49.103 Senior Life Saving.
- 49.310 Elementary School Rhythmic Activities (3)** Survey of materials and methods of teaching fundamental movement, rhythms and singing games at the elementary school level.
- 49.320 Methods of Teaching Health and Physical Education (3)** Principles and techniques of instruction as applied to health and physical education classes at both the elementary and secondary school level.
- 49.321 Recreation Programs (3)** A survey of agencies and programs in the field of recreation with attention to principles and techniques for conducting these programs.
- 49.324 Principles and Psychology of Coaching (3)** Principles and techniques of coaching athletic teams with an emphasis on the psychology of teaching and motivating athletes.
- 49.325 Rhythms and Accompaniment (2)** The development of an awareness of rhythms and an understanding of the basic elements of time; and ability to apply these to dance composition and accompaniment.
- 49.326 History and Philosophy of Dance (3)** An understanding and appreciation of the contribution of dance to the cultural development of mankind.
- 49.330 Health and Safety Education (3)** The content and methods in teaching health and safety and a survey of school health and safety programs.
- 49.335 Elementary School Play and Games (3)** Survey and application of physical education and play activities for elementary school children.
- 49.400 Advanced Methods of Teaching Modern Dance (1)** An understanding of the value of dance education and the development of approaches to teaching dance at the various age levels.
- 49.401 Composition of Dance (3)** The discovery of a rich movement vocabulary and the ability to organize these into appropriate dance forms.
- 49.421 Organization and Administration of Health, Physical Education and Athletics (3)** The principles of organizing and administering health, physical education and athletic programs. Consideration of personnel, schedules, equipment, facilities, curriculum, and related problems.
- 49.424 Kinesiology and Physiology of Exercise (3)** The study of mechanical principles as they apply to the performance of motor skills, and the physiological changes that take place in the body during periods of exercise and as a result of physical training.

ADVANCED COURSES

(500-level courses are open to graduate students and advanced undergraduates; 600- and 700-level courses are open only to graduate students.)

- 49.500 Measurement and Evaluation in Health and Physical Education (3)** The purposes and principles of measurement and evaluation in health and physical education. Survey of selected tests and basic statistical techniques for interpretation of results.

- 49.510 Workshop in Health, Physical Education and Recreation (1-3)** The investigation of a specific timely topic in the area of Health, Physical Education or Recreation. Content will vary with each semester. May be repeated for credit.
- 49.520 Current Problems, Trends and Research in Physical Education (3)** The identification of current problems in the profession and a survey and interpretation of research and trends pertaining to them.
- 49.530 Curriculum in Physical Education (3)** Principles and procedures of curriculum development in physical education.
- 49.610 Planning Facilities for Health, Physical Education and Recreation (3)** The principles, criteria, and standards used in planning facilities for Health, Physical Education and Recreation.



NURSING EDUCATION

JOHN W. DEVOR, *Coordinator*

Admissions to this program were discontinued as of the beginning of the Fall session, 1962. Students admitted prior to that date are given five years, or until September, 1967, to complete degree requirements. Inquiries should be made to the Chairman of the Department of Education.

DEGREE PROGRAM

Undergraduate Degree—A program leading to a degree of Bachelor of Arts with a major in Nursing Education is available to students who have completed their basic professional course in nursing and have been certified as registered nurses. Advanced credit up to 30-36 hours may be granted for the basic professional course and applied toward the total of 126 hours required for a degree. Students qualify for the Bachelor's degree upon completion of additional University and departmental requirements described below.

University Requirements	38-43 hours
Language Requirement	12 hours
Departmental Requirements:	
Major Courses	12 hours
45.390-91 Foundations of Nursing Education (3-3), 45.490 Theory and Practice of Hospital Administration (3), and 45.491 Senior Problem Analysis (3).	
Related Courses	27 hours
Tool Course	3 hours
67.100 Voice Science (3).	
Electives	to complete 126 hours

UNDERGRADUATE COURSES

- 45.390-91 Foundations of Nursing (3-3)** History, philosophy, and principles of nursing education; inquiry into special problems of field.
- 45.490 Theory and Practice of Hospital Administration (3)** Application of principles of administration to hospital unit; administrative and supervisory functions of head nurse.
- 45.491 Senior Problem Analysis (3)** Individual study and research on practical problem in the field of nursing; major research paper required.

FACULTY

Full-Time

- E. ROBERT ADKINS (1961), A.B., Ph.D., Columbia. *Associate Professor of Education.*
- RAYMOND W. AIKEN (1957), B.S., M.A., Pennsylvania. *Assistant Professor of English.*
- MARY H. ALDRIDGE (1955), B.S., Georgia; M.A., Duke; Ph.D., Georgetown. *Professor of Chemistry.*
- CARL G. ANTHON (1961), B.A., Chicago; M.A., Ph.D., Harvard. *Professor of History.*
- SARAH M. BAKER (1945), Pennsylvania Academy of Fine Arts; Academie Montparnasse, Paris; Phillips Memorial Gallery. *Associate Professor of Art.*
- MERRITT C. BATCHELDER (1935), A.B., Hillsdale; M.A., Columbia; Ph.D., Iowa. *Professor of English.*
- EDWARD W. BAUMAN (1957), B.A., DePauw; S.T.B., Ph.D., Boston. *Associate Professor of Religion.*
- ARTHUR P. BEAN, JR. (1963), B.A., M.A., Virginia. *Assistant Professor of English.*
- W. DONALD BOWLES (1957), B.A., University of Washington; M.A., Ph.D., Columbia. *Associate Professor of Economics.*
- LOTHAR BRABANSKI (1957), Master, Academy of Fine Arts, Berlin. *Assistant Professor of Art.*
- DAVID J. BRANDENBURG (1948), B.S., Bowdoin; A.M., Ph.D., Columbia. *Professor of History.*
- WALTER A. BRANFORD (1946), A.B., Washington College; M.A., Duke. *Assistant Professor of English.*
- ANN BAKER BRAUN (1962), B.A., M.A., Boston; Ph.D., New Hampshire. *Assistant Professor of Chemistry.*
- EDWARD J. BREYERE (1961), B.S., M.S., Ph.D., Maryland. *Associate Professor in Research of Biology.*
- SUMNER O. BURHOE (1956), B.S., Massachusetts; M.S., Kansas State; Ph.D., Harvard. *Professor of Biology.*
- EDWARD I. BURKART (1960), B.S., M.S., Georgetown. *Assistant Professor of Languages and Linguistics.*
- SAMUEL E. BURR, JR. (1947), Litt.B., Rutgers; M.A., Wisconsin; M.A., Columbia; Ed.D., Cincinnati. *Professor of Education.*
- NONA BURRESS (1960), A.B., Western Kentucky State College; M.A., Kentucky; Ed.D., Florida. *Associate Professor of Education.*
- DAVID L. CARRASCO (1956), B.A., Texas Western College; M.Ed., Maryland. *Associate Professor of Health, Physical Education and Recreation.*
- STAFFORD H. CASSELL (1937), B.A., American; M.S., Pennsylvania State; LL.D., Lycoming. *Professor of Health, Physical Education and Recreation.*
- DORIS N. CELARIER (1962), B.A., North Dakota. *Instructor in English.*
- ALFRED B. CHAET (1958), B.S., M.S., Massachusetts; Ph.D., Pennsylvania. *Professor of Biology.*
- MARIE A. CHARBONNEAUX (1960), Baccalaureat, Licence en-Droit, University of Paris; Etudes Pratiques d'Anglais, Sorbonne. *Assistant Professor of Languages and Linguistics.*
- GAY E. CHENEY (1960), B.S., Bouvé-Boston School, Tufts. *Assistant Professor of Health, Physical Education and Recreation.*
- CHARLES M. CLARK (1941), A.B., M.A., Ph.D., Cornell. *Professor of English.*

- JAMES C. CLEES (1960), B.A., M.A., Duke. *Assistant Professor of English.*
- HORACE D. CRAWFORD (1946), A.B., Hillsdale. *Associate Professor of Journalism and Public Relations.*
- PAUL R. CURTIS (1960), B.A., College of Wooster; M.S., Ph.D., Ohio State. *Assistant Professor of Biology.*
- ROBERT A. D'ARISTA (1961), New York University; Columbia; Academie Grand Chaumiere, Paris. *Instructor in Fine and Applied Arts.*
- CHARLES M. DAVIS (1961), A.B., M.S., Ph.D., Catholic. *Assistant Professor of Physics.*
- MONIQUE DE JONG (1962), Licence, C.A.P.E.S., Strasbourg. *Instructor in Languages and Linguistics.*
- DONALD DERBY (1947), B.A., Bowdoin; M.A., Ph.D., Harvard. *Professor of History.*
- JOHN W. DEVOR (1956), A.B., M.A., Kansas; Ph.D., Chicago. *Professor of Education.*
- HAROLD A. DURFEE (1955), Ph.B., Vermont; B.D., Yale; Ph.D., Columbia. *William Frazer McDowell Professor of Philosophy.*
- ARTHUR A. EKIRCH, JR. (1947), B.A., Dartmouth; M.A., Ph.D., Columbia. *Professor of History.*
- IRENE W. ENO (1959), Cert., Sacker's School of Design. *Assistant Professor of Art.*
- THOMAS W. EVAUL (1959), B.A., Guilford College; M.Ed., North Carolina; P.E.D., Indiana. *Associate Professor of Health, Physical Education and Recreation.*
- RENEE W. FANTIN (1961), B.A., American; B.A., George Washington. *Instructor in Languages and Linguistics.*
- EDUARD FARBER (1960), Abitur, Ober-Realschule, Leipzig; Ph.D., Leipzig. *Research Professor of Chemistry.*
- JANICE M. P. FISH (1962), B.A., Utah; M.A., Pennsylvania. *Assistant Professor of Psychology.*
- ROBERT H. FRAILEY (1949), B.S., American. *Assistant Professor of Health, Physical Education and Recreation.*
- JOHN G. FRANK (1948), Ph.D., Munich; Ph.D., Michigan. *Professor of Languages and Linguistics.*
- RALPH H. GABRIEL (1958), B.A., M.A., Ph.D., Yale; M.A., Cambridge; Litt.D., Bucknell, Williams. *University Professor of American Studies.*
- HOWARD S. GALL (1963), B.A., Yale; M.A., Ph.D., North Carolina. *Assistant Professor of Sociology and Anthropology.*
- ROBERT F. GATES (1946), Detroit School of Arts and Crafts; Art Students League of New York; Phillips Gallery; Colorado Springs Fine Arts Center. *Associate Professor of Art; Artist in Residence.*
- GEORGE E. GEESEY (1959), B.S.S.S., American. *Instructor in Speech Arts.*
- DOROTHY D. GONDOS (1947), B.A., Swarthmore; M.A., Ph.D., Pennsylvania. *Professor of History.*
- LEROY S. GRAHAM (1960), B.A., American; B.D., Drew Theological Seminary. *Assistant Professor of Sociology.*
- CHALMER A. GROSS (1959), B.S., M.S., Illinois; Ph.D., Chicago. *Professor of Education.*
- EDITH H. GROTEBERG (1963), B.A., Ph.D., Northwestern; M.A., Chicago. *Visiting Associate Professor of Education.*
- REGINE J. GUNLICKS (1963), B.A., University of Goettingen. *Instructor in Languages and Linguistics.*

- ROSS GUNN (1958), B.S.E. (E.E.), M.S., Michigan; Ph.D., Yale. *Research Professor of Physics.*
- DOUGLAS L. GUY (1962), B.A., Macalester; S.M., Chicago; Ph.D., Washington University. *Assistant Professor of Mathematics and Statistics.*
- DORIS E. HADARY (1962), B.S., Illinois. *Instructor in Chemistry.*
- MARK HARRISON (1960), B.S., Northeast Missouri State College; Ph.D., Catholic. *Professor of Physics.*
- WILLIAM M. HARRISON (1962), B.A., California. *Assistant Professor of Anthropology.*
- WILLIAM HASKETT (1959), B.A., University of Nottingham; M.A., Ph.D., University of California at Los Angeles. *Assistant Professor of History.*
- VIRGINIA E. HAWKE (1950), B.S., M.A., Ohio State. *Associate Professor of Health, Physical Education and Recreation.*
- EVELYN SWARTHOUT HAYES (1951), B.M., Kansas; Tobias Matthay Piano School, London. *Associate Professor of Music.*
- ROBERT M. HENDERSON (1960), B.A., Michigan State College; M.F.A., Carnegie Institute of Technology. *Associate Professor of Speech Arts.*
- HELENE MCKINSEY HERZBRUN (1957), B.A., Chicago. *Assistant Professor of Art.*
- RAY E. HIEBERT (1958), B.A., Stanford; M.S., Columbia; M.A., Ph.D., Maryland. *Associate Professor of Journalism and Public Relations.*
- THOMAS H. HILL (1963), B.M., M. Mus., Boston. *Instructor in Music.*
- FRANCES HOLLIDAY (1959), B.S., Northwest Missouri State Teachers College; M.A., Missouri; Ed.D., George Washington. *Professor of Education.*
- MARY ANN G. HOOD (1957), B.A., M.A., Michigan State; M.A., American. *Assistant Professor of English.*
- JOSEPHINE W. HUBBELL (1962), B.S., William and Mary; M.A., Iowa; Ph.D., New York University. *Associate Professor of Health, Physical Education and Recreation.*
- LOUIS C. HUNTER (1957), A.B., Knox College; M.A., Ph.D., Harvard. *Professor of History.*
- JACEK JARZYNSKI (1963), B.Sc., Ph.D., Imperial College, London. *Assistant Professor of Physics.*
- RALPH C. JOHN (1949), B.A., Berea College; S.T.B., S.T.M., Boston; Ph.D., American. *Professor of Religion.*
- PAUL J. JOHNSON (1963), B.A., Chicago. *Instructor in Philosophy.*
- IRVING J. KATZ (1959), B.S., Brooklyn College; M.A., Ohio State. *Assistant Professor of Mathematics and Statistics.*
- ANDREW S. KECK (1946), B.A., Williams College; M.A., M.F.A., Princeton. *Professor of Art History.*
- FAYE L. KELLY (1962), B.A., M.A., Florida. *Assistant Professor of English.*
- DAVID J. KING (1958), B.A., Boston; M.A., Maine; Ph.D., Maryland. *Associate Professor of Psychology.*
- FRANCES H. KING (1957), B.A., Western College for Women; M.A., Ohio State. *Assistant Professor of English.*
- BASIL P. KORIN (1961), B.A., Connecticut; M.S., Stanford. *Assistant Professor of Mathematics and Statistics.*
- Y. H. KRIKORIAN (1962), A.B., Robert College; M.A., Ph.D., Harvard. *Visiting Professor of Philosophy.*
- HARRY LEE (1958), California Institute of Fine Arts; Pennsylvania Academy of Fine Arts. *Assistant Professor of Journalism and Public Relations.*

- PAUL D. LEEDY (1961), A.B., Dickinson College; M.A., Pennsylvania; Ph.D., New York University. *Associate Professor of Education.*
- ROBERT C. LESTER (1962), B.A., Montana State; B.D., M.A., Yale. *Assistant Professor of Philosophy and Religion.*
- DIETER K. LOFFNER (1963), University of Koln, University of Freiburg. *Assistant Professor of Languages and Linguistics.*
- FRANK LORIMER (1938), B.A., Yale; M.A., Chicago; B.D., Union Theological Seminary; Ph.D., Columbia. *Professor of Sociology.*
- GEORGE J. LOVE (1957), B.S., M.A., Columbia. *Assistant Professor of English.*
- GRACE S. MANCILL (1957), B.A., Cornell; M.A., American. *Assistant Professor of Languages and Linguistics.*
- JEANNE A. MASENGILL (1960), B.A., Agnes Scott College; M.A., Pennsylvania. *Assistant Professor of English.*
- RUTH E. McFEETER (1955), B.S., Beaver College; M.A., Columbia. *Assistant Professor of Health, Physical Education and Recreation.*
- JAMES L. McLAIN (1934), B.A., George Washington; Cert., Peabody Conservatory of Music. *Professor of Music.*
- VADIM MEDISH (1963), B.A., Pennsylvania; M.A., Ph.D., American. *Assistant Professor of Languages and Linguistics.*
- BERNARD MILLER (1959), B.S., M.S., Virginia Polytechnic Institute; Ph.D., McGill. *Associate Professor of Chemistry.*
- DENNIS D. MILLER (1962), B.S., Goshen College; M.Ed., Kent State. *Assistant Professor of Education.*
- KARLEN MOORADIAN (1963), B.S., M.S., Northwestern. *Assistant Professor of Journalism and Public Relations.*
- HARVEY C. MOORE (1951), B.A., Delaware; Ph.D., New Mexico. *Professor of Anthropology.*
- ALAN D. MORRIS (1961), B.E., Dr. Eng., Johns Hopkins. *Assistant Professor of Physics.*
- JEAN S. MORTON (1963), B.S., D. C. Teachers College; M.S.S.T., American. *Instructor in Biology.*
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